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Vol. 969 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

April 4, 1978

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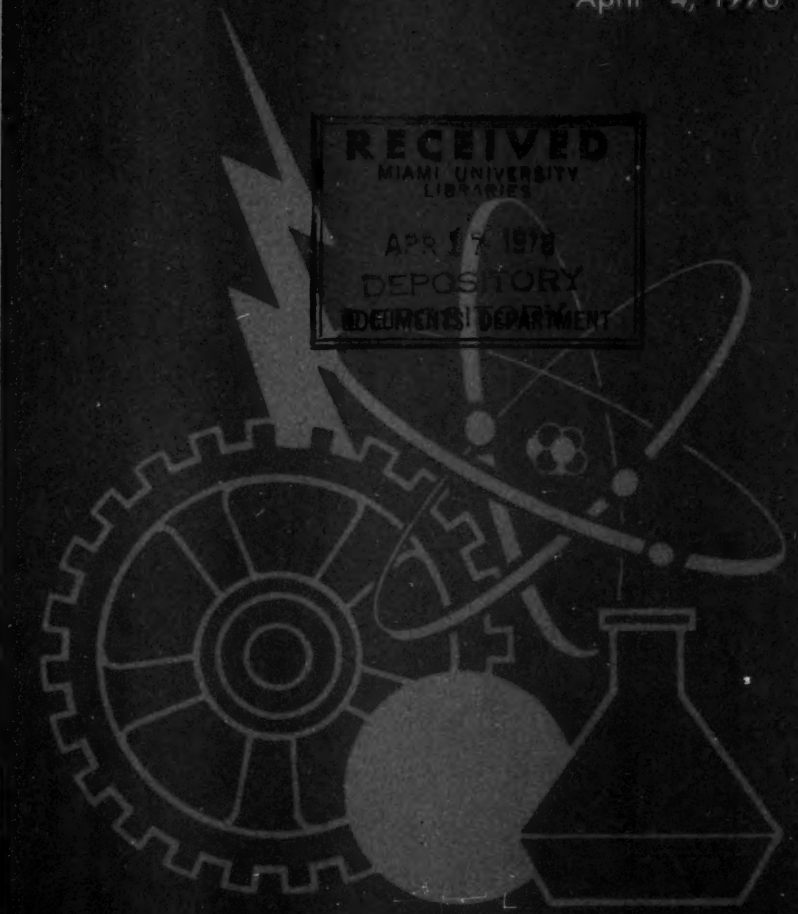

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

April 4, 1978 Volume 969 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

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The correct stock number to be used when ordering the "1976 Index of Trademarks" through the Superintendent of Documents is as follows: 003–004–00532–7. The cost of this publication is $8.00 per copy.

RICHARD J. SHAKMAN,
Mar. 14, 1978. *Assistant Commissioner for Administration.*

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This notice is effective with the publication date and supersedes the notice published on this subject in 939 O.G. 1, dated October 7, 1975.

RICHARD J. SHAKMAN,
Mar. 14, 1978. *Assistant Commissioner for Administration.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,737,503, Sprague and Scantlebury, Jr., METHOD OF MAKING AN EXPANDED OR CELLULAR POLYVINYL CHLORIDE COMPOSITION, **filed** May 24, 1972, D.C. Conn. (New Haven), Doc. 15056, *The B. F. Goodrich Company* v. *No-Ark, Inc.* Stipulation and order for dismissal of action with prejudice entered, ordering defendants to refrain from using any validly existing trade secrets asserted by Goodrich in the actions in competition, etc., Aug. 12, 1977. **Same, filed** July 28, 1969, D.C. Conn. (New Haven), Doc. 13–303, *The B. F. Goodrich Company* v. *Cellular Industries, Inc. et al.* Stipulation and order for dismissal of action with prejudice, entered, ordering defendants to refrain from using any validly existing trade secrets asserted by Goodrich in the action in competition with Goodrich, etc., Aug. 12, 1977.

2,972,349, R. A. DeWall, CAPILLARY OXYGENATOR; **3,228,876,** H. I. Mahon, PERMEABILITY SEPARATORY APPARATUS; **3,546,200,** B. J. Lipps, Jr., PROCESS FOR THE FABRICATION OF A CELLULOSE HOLLOW FIBER SEPARATORY CELL, **filed** Mar. 6, 1975, D.C. Del. (Wilmington), Doc. 75–67, *Cobe Laboratories, Inc. and Abcor, Inc.* v. *The Dow Chemical Co., Cordis Dow Corp. and The Regents of the University of Minnesota.* Judgment, except to the extent of the agreement cited, plaintiffs are hereby permanently enjoined from infringement of any of the claims of said patents. Said complaint is dismissed with prejudice, Aug. 30, 1977.

3,002,770, Chesnut and Singalewitch, THREADED JOINT WITH LUBRICATING AND SEALING RIBBON INTERPOSED BETWEEN THE THREADS, **filed** Feb. 24, 1972, D.C. Del. (Wilmington), Doc. 4334, *Johnson & Johnson* v. *W. L. Gore & Associates, Inc.* Order, claims 1, 2, and 3 of said patent are invalid for obviousness under 35 U.S.C. 103. Plaintiff is not barred from enforcing the above patent by reason of fraud, bad faith, laches or estoppel, Aug. 31, 1977.

3,049,399, Gamson and Kuehner, COMPOSITION AND METHOD FOR DEODORIZING AIR, **filed** Sept. 12, 1977, D.C., S.D. Tex. (Houston), Doc. CA H–77–1508, *H. E. Burroughs & Associates, Inc.* v. *Contamination Control, Inc.*

3,064,246, L. L. Waugh, ELECTRICALLY ILLUMINATED SIGN, filed Sept. 6, 1977. D.C., E.D. Mo. (St. Louis), Doc. 77–956C(3), *Lorin L. Waugh, doing business as Waugh Electronics* v. *Richard C. Kohm, doing business as Aero Ads of Missouri.*

3,073,235, Smith and Randall, ROOF VENTILATORS, **Re. 25,921,** L. L. Smith, ROOF RIDGE VENTILATOR, **filed** Aug. 26, 1977, D.C., S.D. Ill. (Peoria), Doc. 77–1099, *HC Products Co.* v. *Air Vent, Inc. and Laurence Edward Curran, Jr.*

3,077,724, Stoddard and Seem, APPARATUS FOR PROCESSING YARNS, **filed** Sept. 7, 1977, D.C., W.D.N.C. (Charlotte), Doc. C–C–77–0252, *Lex Tex Ltd. Inc.* v. *Leesona Corporation.*

3,147,882, A. R. Waters, STACKING AND NESTING CONTAINER, **filed** Jan. 31, 1973, D.C., E.D. Wis. (Milwaukee), Doc. 73–C–47, *Alfred R. Waters* v. *G. B. Lewis & Co.* Consent judgment and decree, said patent infringed by defendant. Defandant's counterclaim is dismissed with prejudice, Sept. 6, 1977.

3,155,249, L. N. Johnson, BOAT SUPPORT FOR TRAILERS, **filed** Sept. 13, 1977, D.C., N.D. Tex. (Fort Worth), Doc. CA–4–77–249, *E-Z Loader Boat Trailers, Inc.* v. *Shoreline Trailer Sales, Inc.*

3,228,876. (See 2,972,349.)

3,270,268, Carmichael, Maier and Schilling, ALTERNATOR WITH SILICON CONTROLLED RECTIFIER REGULATOR FOR BATTERY CHARGING, **filed** Aug. 29, 1977, D.C. M.D. Fla. (Orlando), Doc. 77–372–Orl–R, *Syncro Corporation* v. *Minks Electronics Inc.*

3,397,001, N. R. Friedman, CLOSURE LATCH ASSEMBLY, **filed** Aug. 26, 1977, D.C., N.D. Ohio (Akron), Doc. C77–323A, *Kindergard Corporation* v. *Pace Inc., Donkin Products Inc., Raymond C. Casper and Charles Casper.*

3,440,525, C. P. Cardeiro, pH METER AND CONTROL SYSTEM, **filed** Sept. 6, 1977, D.C., E.D. Ill. (Danville), Doc. CV 77–0167–D, *Uniloc, Inc.* v. *Stran Corporation and Aquatronics International Inc.*

3,441,393, Finneran, Mayo, Multhaup and Smith, PROCESS FOR THE PRODUCTION OF HYDROGEN-RICH GAS, **filed** Aug. 22, 1975, D.C., W.D. Okla. (Oklahoma City), Doc. C–750713–D, *Pullman Incorporated* v. *W. R. Grace & Co. and Woodward Chemical Corporation.* Complaint of defendant is dismissed without prejudice and counterclaims dismissed with prejudice, Aug. 18, 1977.

3,463,197, W. L. Slade, WIRE-BRAIDED HYDRAULIC HOSE, **filed** July 14, 1975, D.C. Del. (Wilmington), Doc. 75–195, *Raybestos-Manhatton, Inc.* v. *Atlas Corporation.* Pursuant to the provisions of Rule 41, F.R. Civ. P., it is stipulated that the complaint and counterclaim be and the same hereby are dismissed, Aug. 31, 1977.

3,491,590, B. K. Watkins, POWER STOPPER WEIGHT TRANSFER APPARATUS, **filed** Sept. 13, 1977, D.C., M.D. Pa. (Scranton), Doc. C–77–846, *Billy K. Watkins* v. *Franklin County Tractor, Puller Association, Inc. and Carl B. Allison.*

3,540,684, S. L. Snyder, PILOT CHUTE CONTROLLED INFLATION SYSTEM FOR PARACHUTES; **3,866,862,** same, RISER CONTROLS FOR GLIDING PARACHUTES, **filed** Aug. 31, 1977, D.C.N.J. (Camden), Doc. C–77–1812, *Stephen L. Snyder* v. *North American Aerodynamics, Inc. and John P. Higgins.*

3,546,209. (See 2,972,349.)

3,624,536. D. E. Norton, HIGH-DYNAMIC-RANGE AMPLIFIER, **filed** Sept. 15, 1977, D.C., M.D. Fla. (Orlando), Doc. 77-395-Orl-R, *Adams-Russell Co., Inc.* v. *Q-Bit Corporation.*

3,675,367, R. D. Amburn, APPARATUS FOR MAGNETICALLY TREATING SEEDS, **filed** May 17, D.C., E.D. Mich. (Detroit), Doc. 76-71002, *Raymond D. Amburn and Agro-Magnetics, Inc.* v. *Harold Forster Industries Ltd. and Qsine Corporation Limited.* Consent judgment, except as expressly reserved in the agreement of settlement, nonexclusive license and release between the parties, the parties hereby release each other from all claims, counterclaims and defenses raised in the pleadings and any such claims and counterclaims are hereby dismissed with prejudice, Sept. 6, 1977.

3,732,913, W. A. Wrono, TOLL-UP SLATTED SHADE ASSEMBLY, **filed** Nov. 21, 1973, D.C. S.D. Fla. (Fort Lauderdale), Doc. (FL) 73-155-JE, *Wrono Enterprise Corporation* v. *Sandor-Tapco, Inc.* Settlement and consent to entry of final decree, defendant enjoined from manufacture, use and sale of all infringing products, Jan. 15, 1974. **Same, filed** Jan. 30, 1974, D.C., S.D. Fla. (Fort Lauderdale), Doc. (FL) 74-36-JE, *Wrono Enterprise Corporation* v. *Armor Shield Aluminum Products, Inc. and Armor Shield Products Company.* Settlement and consent to final decree, defendants agree to discontinue from manufacture, sale and/or use of any purlin and headed assembly of a roll-up slatted shade assembly, etc., July 29, 1974.

3,778,800, Blackwell and Staby, SELF-MONITORING BATTERY OPERATED CIRCUIT; **3,899,732,** P.A. Staby, METHOD AND APPARATUS FOR MONITORING BATTERY ENERGY LEVEL, **filed** Sept. 7, 1977, D.C. Colo. (Denver), Doc. 77-W-830, *Teledyne Industries Inc.* v. *Statitrol Corporation.*

3,814,139, Loyd and Mills, INSULATING CONNECTOR; **3,908,267,** same, METHOD OF APPLYING AN INSULATING CONNECTOR, **filed** Sept. 1, 1977, D.C., W.D.N.C. (Statesville), Doc. ST-C-77-34, *Stone Industrial Division of J. L. Clark Mfg. Co.* v. *Niemand Industries, Inc.*

3,855,208, Rutner, Rapun and Lewin, DERIVATIVES OF DIGOXIGENIN; **3,953,431,** same, **filed** Oct. 29, 1975, D.C. Mass. (Boston), Doc. C.A. 75-4481-C, *Becton, Dickinson and Co., Inc.* v. *Clinical Assays, Inc.*

3,863,192, I. R. Grey, WATERPROOF MECHANICALLY PROTECTED SENSOR PACKAGE AND METHOD OF INSTALLATION, **filed** Aug. 25, 1977, D.C., N.D. Calif. (San Francisco), Doc. C-77-1897-WWS, *Irving Richard Grey* v. *C.T.E., Inc. and John J. Labno.*

3,866,862. (See 3,540,684.)

3,899,732. (See 3,778,800.)

3,908,267. (See 3,814,139.)

3,953,431. (See 3,855,208.)

3,999,050, S. G. Pitroda, ELECTRONIC DIARY, **filed** Aug. 31, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3246, *Satyan G. Pitroda* v. *American Express Company.*

Re. 25,921. (See 3,073,235.)

D. 198,760, L. T. Harris, RIVETLESS CHAIN LINK, **filed** Feb. 10, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75-66, *Janes Manufacturing, Inc.* v. *Portee, Inc.* Stipulation and order dismissing action with prejudice, Aug. 29, 1977.

D. 243,427, W. R. Watts, FRAME FOR A SEAT, **filed** Sept. 9, 1977, D.C. Del. (Wilmington), Doc. 77-343, *William R. Watts* v. *University of Delaware.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,549,089, Re. S.N. 854,905, Filed Nov. 25, 1977, Cl. 236/15, METHOD AND MEANS FOR TRIMMING POSITION CONTROL MEMBERS, Bruce E. Hamlett, Owner of Record: *Milton Roy Company, St. Petersburg, Fla.,* Attorney or Agent: Richard E. Kurtz, Ex. Gp.: 344

3,892,270, Re. S.N. 811,502, Filed Jun. 30, 1977, Cl. 166/251, PRODUCTION OF HYDROCARBONS FROM UNDERGROUND FORMATIONS, Robert H. Lindquist, Owner of Record: *Chevron Research Company, San Francisco, Calif.,* Attorney or Agent: James A. Buchanan, Jr., Ex. Gp.: 354

3,901,181, Re. S.N. 874,184, Filed Feb. 1, 1978, Cl. 118/7, CEMENT APPLYING MECHANISM, Walter Vornberger, Owner of Record: *International Shoe Machine Corporation, Nashua, N.H.,* Attorney or Agent: Albert Gordon, Ex. Gp.: 352

3,935,546, Re. S.N. 872,275, Filed Jan. 25, 1978, Cl. 331/116 R, COMPLEMENTARY MOS TRANSISTOR CRYSTAL OSCILLATOR CIRCUIT, Shinji Morozumi, et al., Owner of Record: *Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan,* Attorney or Agent: Harold I. Kaplan, et al., Ex. Gp.: 252

3,938,553, Re. S.N. 874,575, Filed Feb. 2, 1978, Cl. 137/625.47, VALVE CONSTRUCTION, Robert Ortega, Owner of Record: *Inventor,* Attorney or Agent: William W. Haefliger, Ex. Gp.: 341

3,938,708, Re. S.N. 867,456, Filed Jan. 6, 1978, Cl. 222/95, AEROSOL DISPENSING SYSTEM, Norman D. Burger, Owner of Record: *Norman D. Burger, Culver City, Calif.; Nicholas A. Mardesich, Palos Verdes Estates, Calif.,* Attorney or Agent: Thomas H. Jones, et al., Ex. Gp.: 344

3,949,258, Re. S.N. 872,120, Filed Jan. 25, 1978, Cl. 313/25, METHOD AND MEANS FOR SUPPRESSING OZONE GENERATED BY ARC LAMPS, Charles Soodak, Owner of Record: *Baxter Travenol Laboratories, Inc., Deerfield, Ill.,* Attorney or Agent: Paul C. Flattery, et al., Ex. Gp.: 252

3,952,849, Re. S.N. 862,764, Filed Dec. 20, 1977, Cl. 192/41, SPRAG CLUTCHES, Edward Joseph Brownhill et al., Owner of Record: *Renold Limited, Manchester, England,* Attorney or Agent: Robert D. Flynn, et al., Ex. Gp.: 345

4,000,000, Re. S.N. 875,397, Filed Feb. 6, 1978, Cl. 106/280, PROCESS FOR RECYCLING ASPHALT-AGGREGATE COMPOSITIONS, Robert L. Mendenhall, Owner of Record: *Inventor,* Attorney or Agent: Jerry R. Seiler, Ex. Gp.: 142

PATENT NOTICES

Certificates of Correction for the Week of Apr. 4, 1978

D. 244,927	4,038,423	4,051,950	4,059,735
D. 246,731	4,038,534	4,052,037	4,060,585
3,776,629	4,039,067	4,052,263	4,060,851
3,778,583	4,039,175	4,052,462	4,060,981
3,859,448	4,039,715	4,052,586	4,061,015
3,898,081	4,040,000	4,052,691	4,061,063
3,908,063	4,040,801	4,052,938	4,061,145
3,910,944	4,041,055	4,053,285	4,061,383
3,921,598	4,041,229	4,053,433	4,061,453
3,925,507	4,041,413	4,055,601	4,061,593
3,933,643	4,042,603	4,055,638	4,061,770
3,935,182	4,043,028	4,055,790	4,061,906
3,938,051	4,044,345	4,056,047	4,061,998
3,948,959	4,044,520	4,056,352	4,062,096
3,959,140	4,044,793	4,056,368	4,062,335
3,966,332	4,045,112	4,056,470	4,062,340
3,967,774	4,045,504	4,056,651	4,062,486
3,972,908	4,046,080	4,056,707	4,062,565
3,980,006	4,046,666	4,056,850	4,062,580
4,011,269	4,046,730	4,057,069	4,062,849
4,011,838	4,046,774	4,057,221	4,062,873
4,013,696	4,046,952	4,057,310	4,062,875
4,015,393	4,047,012	4,057,322	4,062,879
4,017,440	4,047,125	4,057,349	4,063,010
4,018,901	4,048,140	4,057,413	4,063,023
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4,032,429	4,049,857	4,058,954	4,064,151
4,032,510	4,050,277	4,058,979	4,064,368
4,032,712	4,050,405	4,059,179	4,064,633
4,033,761	4,050,530	4,059,306	4,065,134
4,034,193	4,050,643	4,059,483	4,065,316
4,035,301	4,050,895	4,059,497	4,065,456
4,035,625	4,050,942	4,059,518	4,066,157
4,036,798	4,050,978	4,059,582	4,066,174
4,036,861	4,051,073	4,059,602	
4,037,316	4,051,391	4,059,657	

Disclaimer

3,982,923.—*Eugene G. Teach* El Cerrito, Calif. GEM-BIS AMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE. Patent dated Sept. 28, 1976. Disclaimer filed Nov. 21, 1977, by the assignee, *Stauffer Chemical Company.*

Hereby enters this disclaimer to claims 1 through 15 of said patent.

Dedication

3,050,533.—*Neil Munro* and *Duncan Maclean,* Harrogate, England. MANUFACTURE OF ESTERS. Patent dated Aug. 21, 1962. Dedication filed Feb. 2, 1978, by the assignee, *Imperial Chemical Industries Limited.*

Hereby dedicates to the Public the remaining term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF INTERIOR
Branch of Patents
18th & C St. NW.
Washington, D.C. 20240

Patent Application 815,127. Muffler for Pneumatic Drill. Filed July 13, 1977.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents Office of Naval Research, Code 302
Arlington, Va. 22217

Patent application 817,884. Fluidic Interface Means. Filed July 20, 1977.

Patent application 832,507. Active Waveguide Coupler for Surface Acoustic Waves. Filed Sept. 12, 1977.

Patent application 833,414. Strain Actuated Hydraulic Holdback Bar. Filed Sept. 15, 1977.

Patent application 833,415. Catapult Restraint/Release System. Filed Sept. 15, 1977.

Patent application 835,089. Remote Plotter Control System. Filed Sept. 21, 1977.

Patent application 836,167. Explosively-Separated Tongue and Groove Joint. Filed Sept. 23, 1977.

Patent application 836,822. Intense Ion Beam Producing Reflex Triode. Filed Sept. 26, 1977.

Patent application 837,058. Dual Ground Microstrip Antennas. Filed Sept. 28, 1977.

Patent application 839,946. A Vinyl Polymer-Fluoroalkylether Oligomer Composition. Filed Oct. 6, 1977.

Patent application 840,080. Dual Asymmetrically Fed Electric Microstrip Dipole Antenna. Filed Oct. 6, 1977.

Patent application 840,081. Dual Diagonally Fed Electric Microstrip Dipole Antenna. Filed Oct. 6, 1977.

Patent application 840,082. Dual Notch Fed Electric Microstrip Dipole Antenna. Filed Oct. 6, 1977.

Patent application 840,865. Submersible Apparatus for Evacuating Seawater From Suction-Type Work-Handling Gripper Members. Filed Oct. 11, 1977.

Patent application 847,331. Notched/Diagonally Fed Twin Electric Microstrip Dipole Antennas. Filed Oct. 31, 1977.

Patent application 847,454. End Fed Twin Electric Microstrip Dipole Antennas. Filed Oct. 31, 1977.

Patent 4,048,500. Infrared Background Suppression. Filed Nov. 8, 1976. Patented Sept. 13, 1977. Not available NTIS.

Patent 4,051,062. 7-Amino Coumarin Dyes for Flashlamp-Pumped Dye Lasers. Filed Sept. 3, 1976. Patented Sept. 27, 1977. Not available NTIS.

Patent 4,053,886. Stepped Dual-Frequency Ocean-Wave Spectrometer. Filed Nov. 19, 1976. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,054,879. Dual-Frequency, Remote Ocean-Wave Spectrometer. Filed Nov. 19, 1976. Patented Oct. 18, 1977. Not available NTIS.

NATIONAL AERONAUTICS & SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters
NASA Code GP–2
Washington, D.C. 20546

Patent 4,027,494. Low Gravity Phase Separator. Filed Sept. 12, 1975. Patented June 7, 1977. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 11, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-11-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-1-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-20-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-6-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-7-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-10-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-9-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-28-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-5-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-28-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-17-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-6-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-9-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-9-77

Expiration of patents: The patents within the range of numbers indicated below expire during February 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,970,313 to 2,973,518, inclusive
Plant Patents..... Numbers 2,019 to 2,031, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED APRIL 4, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T969,001
DYED FIBERS

Merton Louis Davis, 3A Palmetto Arms, Camden, S.C. 29020, and Lee Oleh Dworjanyn, 819 Milledge Rd., Augusta, Ga. 30904

Continuation-in-part of Ser. No. 712,650, Aug. 9, 1976, abandoned. This application Oct. 4, 1977, Ser. No. 839,319

Int. Cl.[2] D06P *1/00*

U.S. Cl. 8—25

No Drawing. 24 Pages Specification

Synthetic organic fibers are dyed to a dark brown to black shade with a mixture of dyes, one of the dyes in the mixture being a green to blue dye having an absorption spectrum in which the peak value of absorbance is between 600 and 700 nanometers, said green to blue dye being further characterized in that the ratio of absorbance at 700 nanometers to the absorbance at the peak value between 600 and 700 nanometers is at least 0.05. The presence of this green to blue dye reduces or eliminates transmittance of red light along the fiber axis, so that no reddish glow is seen when the ends of the fibers are observed. The dark brown to black fibers are thus well suited for use in artificial furs.

T969,002
GRANULAR AMMONIUM PHOSPHATE SULFATE AND UREA-AMMONIUM PHOSPHATE SULFATE USING A COMMON PIPE-CROSS REACTOR

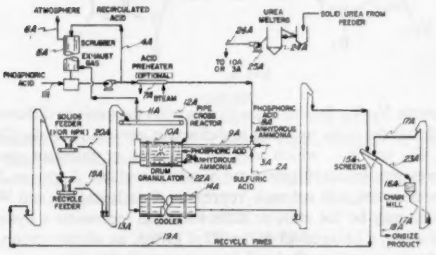
Melvin M. Norton, Sheffield, and Byron R. Parker, Florence, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Jul. 25, 1977, Ser. No. 818,602

Int. Cl.[2] C05C *9/00*; C05B *7/00*

U.S. Cl. 71—29

7 Sheets Drawing. 33 Pages Specification



FLOWSHEET OF THE GRANULATION PILOT-PLANT FOR PRODUCTION OF UREA-AMMONIUM PHOSPHATE SULFATE FERTILIZER USING PIPE-CROSS REACTOR

Process for production of fertilizers from phosphoric and sulfuric acids, anhydrous ammonia, and urea, and for the production of high-analysis granular ammonium phosphates, ammonium phosphate sulfates, and urea-ammonium phosphate sulfates—some with polyphosphate contents of up to 68 percent of the total P_2O_5. A specially designed pipe-cross reactor is used to produce a homogeneous melt or slurry of low moisture content from the reactants and thus eliminates the need for a preneutralizer as used in many prior-art granular fertilizer processes. Because of the low melt or slurry moisture content, the dryer is eliminated. The elimination of these two items greatly simplifies pollution abatement, since both items are sources of fumes and dust. The equipment used to produce granular monoammonium phosphate, diammonium phosphate, urea-ammonium phosphate sulfate, and ammonium phosphate sulfate fertilizers is inexpensive and simple to operate. The products produced are dust-free and of such particle size that they are well suited for bulk blends. Ammonium phosphate sulfate grades of 12-48-0, 6-24-24, 13-13-13, 10-40-10, a monoammonium phosphate grade of 11-55-0, a diammonium phosphate and diammonium phosphate sulfate grade of 18-46-0, and urea-ammonium phosphate sulfate grades of 33-11-0, 17-17-17, and 20-10-10 have been produced.

T969,003
CONTROLLED RELEASE LIQUID FERTILIZERS

John F. Phillips, Jr., and John J. Kohler, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Jun. 20, 1977, Ser. No. 807,842

Int. Cl.[2] C05G *3/06*

U.S. Cl. 71—64 F

1 Sheets Drawing. 12 Pages Specification

Liquid fertilizers having controlled release properties are prepared from fertilizer solutions and oil-surfactant mixtures. An invert surfactant is dissolved in an oil such as kerosene. The amount of surfactant used can vary over a wide range. Use of between 0.6 and 1.0 percent surfactant in the fertilizer formulation yields fertilizers with acceptable release rates. Liquid fertilizer is slowly added to the oil-surfactant mixture with vigorous agitation causing a water-in-oil emulsion to form. Mixtures containing 80 to 90 percent liquid fertilizer and 10 to 20 percent oil made excellent products.

The final fertilizer product is an invert emulsion containing 80 to 90 percent liquid fertilizer, 10 to 20 percent oil, and 0.6 to 1.0 percent surfactant. The product consists of small droplets of liquid fertilizer solution surrounded by a thin but essential impenetrable oil-surfactant layer. Water slowly dissolves the surfactant from the oil, thus breaking the emulsion and allowing the liquid fertilizer to be released. Ammonium phosphate, ammonium polyphosphate, ammonium nitrate, potassium chloride, uran solutions, and mixtures thereof, may be used as liquid fertilizers.

T969,004
LIGHT-ABSORBING FILTERS

Bruce Martin Watkiss, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 2, 1977, Ser. No. 792,502

Claims priority, application United Kingdom, May 10, 1976, 19105/76

Int. Cl.[2] G03C *5/04*; G03B *5/20, 15/02*

U.S. Cl. 96—27 R

No. Drawing. 10 Pages Specification

Light-absorbing filters comprise a self-supporting polymeric film, such as an oriented polyethylene terephthalate film, containing or coated with a lacquer containing a compound which absorbs light in the wavelength band less than 0.4 μm (i.e. UV light). The filters are particularly useful as UV-absorbing filters for use in flashbulbs for color photography. Suitable light-absorbing compounds are hydroxyphenyl benzotriazoles, e.g. 2(2′-hydroxy-3′,5′-di-t-amylphenyl)benzotriazole, and hydroxy-substituted benzophenone, e.g. 2,2′-dihydroxy-4,4′-dimethoxy-benzophenone.

T969,005
COLOR PHOTOGRAPHIC MATERIALS CONTAINING HIGH-BOILING ORGANIC SOLVENT

Akira Tanaka; Akikazu Mikawa; Yuji Mihara, and Yasuo Mukunoki, all of No. 210 Nakanuma, Minami Ashigara-shi, Kanagawa, Japan

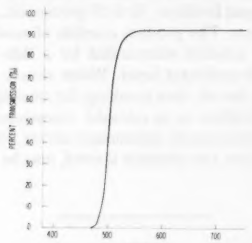
Filed Jul. 25, 1977, Ser. No. 818,704
Claims priority, application Japan, Jul. 23, 1976, 51-88538
Int. Cl.[2] G03C *1/40*
U.S. Cl. 96—100 R
No Drawing. 61 Pages Specification

In a highly or superhighly sensitive color photographic material having at least one highly or superhighly light-sensitive silver halide emulsion layer containing a color-forming coupler and silver iodobromide grains color-sensitized with a dye having at least one sulfo group or carboxy group, the silver halide emulsion grains having a mean grain size of larger than about 1 micron, the occurrence of fog due to pressure stimulus is prevented effectively by the incorporation of a high-boiling organic solvent having a boiling point of higher than about 175° C at normal pressure in the silver halide emulsion layer in an amount of higher than about 20% by weight of the amount of binder present in the emulsion layer.

T969,006
SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSIONS

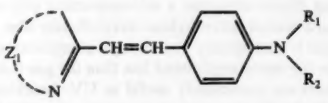
Yuji Mihari; Takeo Sakai; Hideki Ohmatsu, and Akira Sato, all of No. 210, Nakanuma, Minami Ashigara-shi, Kanagawa, Japan

Filed Jul. 15, 1977, Ser. No. 816,118
Claims priority, application Japan, Jul. 15, 1976, 51-84859
Int. Cl.[2] G03C *1/14*
U.S. Cl. 96—126
1 Sheets Drawing. 65 Pages Specification



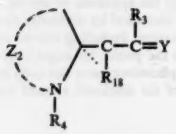
An internal latent image type silver halide photographic emulsion which provides a direct positive image by surface development in the presence of a fogging agent and which is useful in a light-sensitive material for the diffusion transfer process, which emulsion is spectrally sensitized with a supersensitizing combination of at least one sensitizing dye represented by the following general formula (I) or (II)

(I)



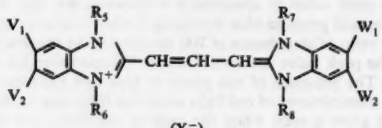
wherein Z_1 represents a non-metallic atomic group necessary to complete a 5- or 6-membered heterocyclic ring; and R_1 and R_2, which may be the same or different, each represents an alkyl group;

(II)



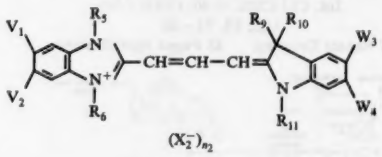
wherein Z_2 represents a non-metallic atomic group necessary to complete a 5- or 6-membered heterocyclic ring; R_3 represents an alkyl group or an aryl group; R_4 represents an alkyl group or a substituted alkyl group; R_{18} represents a hydrogen atom or an alkylene group necessary to complete a ring when R_4 and R_{18} combine to form a ring; and Y represents an oxygen atom or $=N-R_{19}$ wherein R_{19} represents a hydrogen atom, an alkyl group or an aryl group; and at least one sensitizing dye represented by the following general formula (III), (IV), (V), (VI) or (VII)

(III)



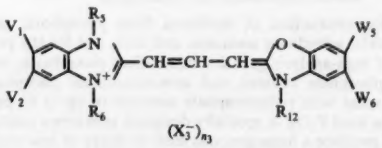
wherein V_1, V_2, W_1 and W_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a trifluoromethyl group, a cyano group, a carboxy group, an alkoxycarbonyl group, an aminosulfonyl group or an alkylsulfonyl group; R_5, R_6, R_7 and R_8, which may be the same or different, each represents an alkyl group or a substituted alkyl group; X_1 represents an acid anion; and n_1 represents **0** or **1**;

(IV)

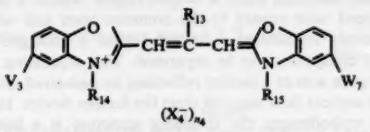


wherein V_1, V_2, R_5 and R_6, which may be the same or different, each has the same meaning as defined in general formula (III); R_9, R_{10} and R_{11}, which may be the same or different, each represents an alkyl group or a substituted alkyl group; X_2 represents an acid anion; n_2 represents **0** or **1**; and W_3 and W_4, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a hydroxy group, an acyloxy group or a phenyl group;

(V)

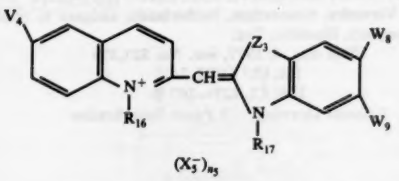


wherein V_1, V_2, R_5 and R_6, which may be the same or different, each has the same meaning as defined in general formula (III); W_5 and W_6, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a hydroxy group, an acyloxy group or a phenyl group; R_{12} represents an alkyl group or a substituted alkyl group; X_3 represents an acid anion; and n_3 represents **0** or **1**;



(VI)

wherein V_3 and W_7, which may be the same or different, each represents a hydrogen atom, an alkyl group, an alkoxy group, a hydroxy group, an acyloxy group or a phenyl group; R_{13} represents an alkyl group; R_{14} and R_{15}, which may be the same or different, each represents an alkyl group or a substituted alkyl group; X_4 represents an acid anion; and n_4 represents **0** or **1**;



(VII)

wherein V_4 represents a hydrogen atom, a halogen atom, an alkyl group, a hydroxy group, an acyloxy group or a phenyl group; Z_3 represents an oxygen atom, a sulfur atom, a selenium atom or —CH=CH—; W_8 and W_9, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a hydroxy group or a phenyl group; R_{16} and R_{17}, which may be the same or different, each represents an alkyl group or a substituted alkyl group; X_5 represents and acid anion; and n_5 represents 0 or 1.

T969,007

METHOD FOR MAKING ROCK BITS

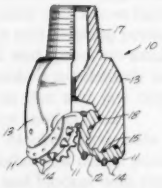
Richard E. Goetz, Huntington Beach, Calif., assignor to Smith International, Inc., Irvine, Calif.

Continuation of Ser. No. 706,632, Jul. 19, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,009

Int. Cl.[2] B23K *15/00*

U.S. Cl. 219—121 EM

4 Sheets Drawing. 15 Pages Specification



A method of making a rock bit which is a welded assembly of legs each carrying a rotatable cutter. Electrochemical grinding is used for finish machining of mating surfaces of heat-treated bit legs, and the legs are secured together by electron-beam welding along the mating surfaces.

T969,008

PRODUCTION OF ORIENTED FIBRILLAR PRODUCTS

Frederic Neil Cogswell, Welwyn Garden City, and Jiri George Tomka, Harrogate, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 4, 1977, Ser. No. 784,630

Claims priority, application United Kingdom, Jan. 25, 1977, 2951/77

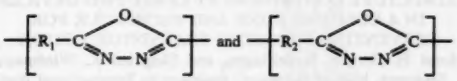
Int. Cl.[2] C08G *73/08*

U.S. Cl. 260—78.41

No Drawing. 34 Pages Specification

The process for the production of an oriented fibrillar product from a polyarylene-oxadiazole which is heat-softenable without substantial degradation when in an air-free inert atmosphere comprises extruding contiguously disposed particles of the polymer, which particles are heat-softened but non-molten and are blanketed in an air-free atmosphere of an inert fluid, through a die to produce a substantially non-degraded oriented fibrillar product. Means are provided, if necessary, to substantially prevent relaxation of the orientation resulting from the extrusion.

Particularly preferred polyarylene-oxadiazoles for use according to the process are the amorphous and non-crystallizable copolymeric polyphenylene-1,3,4-oxadiazoles having the characteristic repeating units



where R_1 is a p-phenylene radical, R_2 is a m-phenylene radical, the ratio of R_1 radicals to R_2 radicals is within the range 60/40 to 10/90, and the R_1 and/or R_2 radicals are sufficiently substituted with bulky groups such as bromine atoms to inhibit crystallisation of the polymer.

Preferably steam and/or water is the protective fluid and is derived from water associated with the polymer particles, the steam being formed by vaporization of the water during extrusion. The particles are usually in the form of a wet cake. The associated water may be present only as surface water (which has not significantly penetrated into the particles) or as water which has significantly penetrated into the polymer particles prior to extrusion. The use of liquid-interpenetrated particles is advantageous in that the vapor and/or compressed liquid provides a high pressure which provides a driving force for the extrusion and also the interpenetrated liquid flashes off from the extrudate leaving the die thereby rapidly cooling the extrudate throughout its thickness and freezing in the orientation. The extrusion product is an attractive paper-like tape, ribbon or sheet comprised of very stiff fibrils and is usually rather porous. The product can be used as such, or when coextruded with other stiff fiber-forming polymers to obtain a highly reinforced extrudate. The fibrous extrudate can also be used as a base within the interstices of which other monomers may be polymerized.

T969,009

TRANSFER OF MAGNETIC TONER PARTICLES WITH A DIRECTED MAGNETIC FIELD

Joseph A. Lahut, and Raymond E. Skoda, both of Scotia, N.Y., assignors to General Electric Company, New York, N.Y.

Continuation of Ser. No. 579,678, May 21, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,292

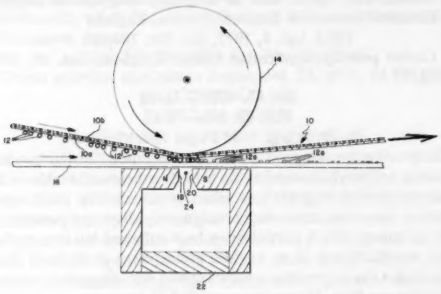
Int. Cl.[2] G03G *19/00*

U.S. Cl. 346—74.1

1 Sheets Drawing. 14 Pages Specification

Magnetic toner images are transferred from a latent magnetic image on a magnetic recording surface to hard copy medium, which may be paper, by (1) disposing the hard copy medium in contact with a toner image; and (2) applying a transfer magnetic field in the region of contact. The transfer magnetic field is directed tangential to the recording surface and has a gradi-

ent directed from the recording surface to the copy medium. The intensity of the magnetic transfer field may be greater or



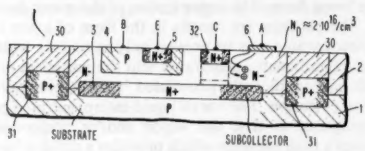
less than the intensity which is necessary to erase the latent magnetic image in the magnetic recording surface.

T969,010

MONOLITHICALLY INTEGRATED SEMICONDUCTOR STRUCTURE CONTAINING AT LEAST TWO DEVICES IN A COMMON ZONE AND TECHNIQUE FOR PREVENTING PARASITIC TRANSISTOR ACTION

Horst H. Berger, Sindelfingen, and Siegfried K. Wiedmann, Stuttgart, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 690,224, May 26, 1976, abandoned.
This application May 20, 1977, Ser. No. 801,433
Claims priority, application Germany, Aug. 1, 1975, 2534398
Int. Cl.[2] H01L *27/02, 29/48*
U.S. Cl. 357—46
2 Sheets Drawing. 27 Pages Specification



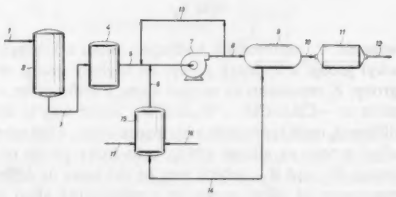
To prevent a parasitic lateral transistor or thyristor effect in an integrated structure including a transistor and a further device sharing one common zone, a doped region which is more highly doped with regard to the common zone and which simultaneously constitutes a contact region is arranged between the components to be separated. This separating and contact region acts as a barrier reflecting an undesired minority carrier current flow injected from the further device. In the preferred embodiment, the transistor structure is a bipolar transistor and the further semiconductor device is a Schottky diode integrated into the collector zone of the bipolar transistor.

T969,011

HOT MELT ADHESIVE EMULSION PROCESS

Hans F. Vermeire, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 4, 1977, Ser. No. 821,879
Int. Cl.[2] C09J *7/02*
U.S. Cl. 427—207 B
1 Sheets Drawing. 9 Pages Specification



A novel process for applying an adhesive to a substrate is disclosed, which process comprises:

a. melt blending a monoalkenyl arene/conjugated diene block copolymer, tackifying resin and extending oil to form a hot melt adhesive composition,

b. emulsifying the hot melt with water and an emulsifying agent, and

c. applying the resulting emulsion as a film on a substrate.

Preferably, the block copolymer is a styrene/isoprene block copolymer and the tackifying resin is selected from the group consisting of diene-olefin copolymers, hydrogenated resins, esters of resin, polyterpenes, terpenephenol resins, and polymerized mixed olefins.

REISSUES

APRIL 4, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

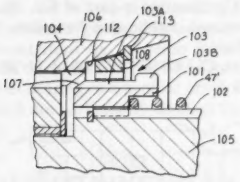
Re. 29,601
TRANSMISSION WITH RESILIENTLY LOADED MAINSHAFT GEARS

Elmer A. Richards, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Original No. 3,921,469, dated Nov. 25, 1975, Ser. No. 452,825, Mar. 20, 1974. Division of Ser. No. 276,376, Jul. 31, 1972, Pat. No. 3,799,002. Application for reissue Dec. 13, 1976, Ser. No. 750,299

Int. Cl.[2] **F16H** *3/38;* **F16D** *13/00, 21/02*

U.S. Cl. 74—339 **9 Claims**



1. In an interengageable jaw clutch system the combination comprising:

first rotatable means and a first jaw clutch portion mounted thereon for axial sliding relationship therewith and positive rotation therewith about an axis;

second rotatable means coaxially related to said first means and a second jaw clutch portion arranged thereon for interengagement with said first jaw clutch portion upon relative axial movement of said jaw clutch portions toward one another;

one of said jaw clutch portions having drive teeth at a radius suitable for engaging with clutch teeth on the other jaw clutch portion, said one clutch portion having also blocking teeth projecting radially beyond and axially offset from said drive teeth;

blocker means coacting between said first and second jaw clutch portions for positively preventing engagement of said jaw clutch portions so long as a substantial difference in relative speed exists therebetween, said blocker means including an annular blocker having blocking portions arranged on and supported by said drive teeth for limited rotation with respect thereto and positioned axially between said blocking teeth and said clutch teeth when said jaw clutch portions are disengaged, some of said blocking teeth being provided with spaces therebetween capable of receiving therein said blocking portions when said blocking portions and said spaces are axially aligned to permit said blocking portions to relatively move axially past said blocking teeth so that said jaw clutch portions can be engaged with one another; and

a surface on said blocker frictionally cooperating with a surface on said other jaw clutch portion for circumferentially offsetting said blocker with respect to said one jaw clutch portion whenever and for so long as a substantial difference in relative rotative speeds exist between said respective jaw clutch portions, said blocking portions interfering with said blocking teeth when said blocker is circumferentially offset so as to prevent engagement of said jaw clutch portions.

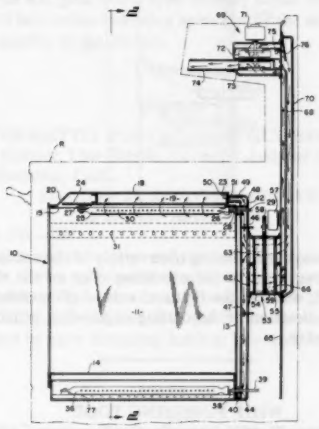
Re. 29,602
DOMESTIC OVEN

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Original No. 3,417,742, dated Dec. 24, 1968, Ser. No. 643,104, Jun. 2, 1967. Application for reissue Oct. 21, 1970, Ser. No. 82,707

Int. Cl.[2] **F24C** *15/32*

U.S. Cl. 126—21 A **9 Claims**



1. A domestic oven comprising a liner forming a cooking cavity having top, bottom, side and rear walls, the bottom walls being substantially smooth and imperforate, broiler burner means mounted in the upper portion of said cavity, with the top wall thereabove having an opening for exhaust of the cavity, bake burner means disposed exteriorly of the cavity, means for delivering combustion air under pressure selectively to either the broiler or bake burner or both, means for circulating the heated products from the bake burner in operation over exterior surfaces of the bottom and side walls, the latter being provided with openings for inflow of such heated products to the cavity and exhaust therefrom through the top wall opening, and means for directing the flue products from such top wall opening to a remote discharge.

Re. 29,603
BUCKET REINFORCEMENT STRUCTURE

Stanley A. Oke, Batavia, and Robert F. Shankwitz, Edelstein, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

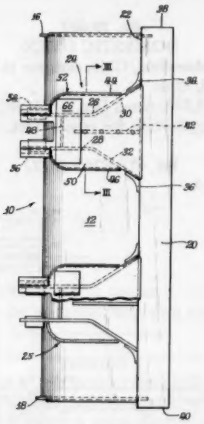
Original No. 3,853,232, dated Dec. 10, 1974, Ser. No. 287,671, Sep. 11, 1972. Application for reissue Dec. 6, 1976, Ser. No. 748,033

Int. Cl.[2] **E02F** *3/70*

U.S. Cl. 214—145 R **23 Claims**

1. In a bucket construction having a bottom wall portion, a rear wall portion extending therefrom, a pair of end wall portions between which the rear wall and bottom wall portions extend, and a cutting edge fixed to and running along the forward edge of the bottom wall portion, reinforcement means comprising: first and second rib members spaced apart and fixed externally to the bottom wall portion and running continuously from the cutting edge, and fixed relative thereto, to the rear of the bottom wall portion; and, a plate fixed to the extending edges of the first and second rib members and running therealong, the rib members and plates together forming a box

section running transversely of the cutting edge, wherein the plate is fixed to the cutting edge, wherein the reinforcement means further comprise a third rib member fixed to the bottom wall portion externally thereof intermediate the first and second rib members and running transversely of the cutting edge, the plate being fixed to the extending edge of the third rib member, and, wherein the first and second rib members flare apart in the direction of the cutting edge when proximate to the cutting edge.



Re. 29,604

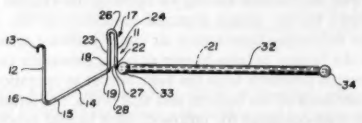
WHIP FINISHING TOOL

Frank W. Matarelli, 4426 Irving St., San Francisco, Calif. 94122

Original No. 3,866,959, dated Feb. 18, 1975, Ser. No. 468,030, May 8, 1974. Application for reissue Jul. 16, 1976, Ser. No. 705,751

Int. Cl.[2] D03J *3/00*

U.S. Cl. 289—17 **12 Claims**



1. A whip finishing tool comprising:

a rigid slender element having a first substantially straight free end portion with a hook formed at its free end;

a substantially straight first intermediate portion having one end connected to and extending laterally from the opposite end of said first end portion;

a second U-shaped intermediate portion having one end connected to the opposite end of said first intermediate portion and extending laterally therefrom in the direction of said first end portion; and

a manually engageable substantially straight second end portion connected to the opposite end of said second intermediate portion and extending therefrom in a direction away from said first intermediate portion.

Re. 29,605

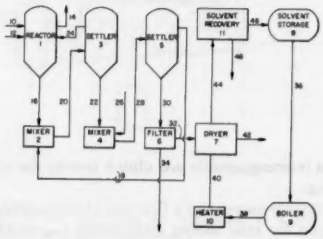
HIGH-POROSITY, HIGH-SURFACE AREA, LOW-BULK DENSITY ALUMINA

William C. Ziegenhain, and John H. Smith, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Original No. 3,907,512, dated Sep. 23, 1975, Ser. No. 439,679, Feb. 4, 1974. Continuation-in-part of Ser. No. 218,882, Jan. 19, 1972, abandoned. Application for reissue May 10, 1976, Ser. No. 690,766

Int. Cl.[2] C01F *7/02*; B01J *11/58*

U.S. Cl. 23—293 A **5 Claims**



1. A method for producing low density, high porosity, high surface area alumina from an aqueous alumina mixture produced by the water hydrolysis of aluminum alkoxides and containing up to about 32 weight percent Al_2O_3, said method consisting essentially of drying said aqueous alumina mixture by contacting said aqueous alumina mixture with [an] *a superheated* alkanol vapor selected from the group consisting of [alkanols containing from 1 to 8 carbon atoms] *ethanol, propanol and isopropanol* and combinations thereof at a temperature to minimize condensation of said alkanol vapors in the aqueous alumina mixture in an amount sufficient to produce alumina containing at least about 50 weight percent Al_2O_3 and having a pore volume from about 1.0 to about 2.75 cc/g, a loose bulk density from about 7.5 to about [25] *21* lb/ft^3 and a surface area from about 260 to about 400 m^2/g, *and thereafter further drying said alumina with superheated steam.*

PLANT PATENTS

GRANTED APRIL 4, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,232
FRENCH PRUNE

Martin Friedman, and Cora G. Friedman, both of Rte. 1, Box 119, Biggs, Calif. 95917

Filed Aug. 16, 1976, Ser. No. 669,504
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—38 **1 Claim**

1. A novel French prune substantially as shown and described, characterized by its dense foliage; upright, vase shaped tree form of medium to large size; its vigorous growth; and its consistent bearing of a profuse crop of large, excellent grade fruit which are particularly adapted for drying.

4,233
PEONY PLANT NAMED MY PAL RUDY

Roy G. Klehm, Barrington, Ill., assignor to Klehm Boys' Partnership, Arlington Heights, Ill.

Filed Apr. 14, 1977, Ser. No. 787,714
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinct variety of peony plant substantially as herein shown and described, characterized by the rose-type flower form of its blooms combined with their soft pink coloration, the strong weather-resistant stems on which the blooms are borne, the above average lasting quality of the blooms, and the clean and attractive plant foliage.

4,234
PEONY NAMED WHOPPER

Roy G. Klehm, Barrington, Ill., assignor to Klehm Boys' Partnership, Arlington Heights, Ill.

Filed Apr. 14, 1977, Ser. No. 787,715
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of peony plant substantially as herein shown and described, distinguished by the very large size of its soft pink bomb type flowers borne on sturdy stiff stems, its late spring blooming habit and by the above average lasting quality of the flowers.

4,235
POINSETTIA PLANT NAMED GUTBIER V-10

Gregor Gutbier, Linz (Rhine), Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.

Filed May 27, 1977, Ser. No. 801,160
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive red poinsettia cultivar substantially as nerein shown and described, characterized by its short and rapid habit of growth, its easy self-branching, the unique arched shape and abundance of the bracts, its easy branching habit, and its early blooming habit at low temperatures.

4,236
PECAN TREE NAMED GRACROSS

Harry Cross, Jr., Greenville, Tex., assignor to O. S. Gray, Jr., Arlington, Tex.

Filed May 25, 1977, Ser. No. 800,180
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—31 **1 Claim**

1. A new variety of pecan tree substantially as herein shown and described, characterized by the spreading habit of growth with numerous twiggy nut clusters producing branches growing along the principal limbs of the tree and well inside the periphery of the tree foliage, and by the prolific production of a medium to large sized thin shell nut having a high kernel to shell ratio and good cracking qualities.

PATENTS

GRANTED APRIL 4, 1978

ERRATA

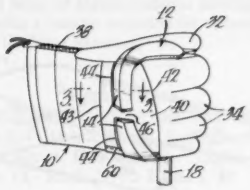
For CLASS	See PATENT NO.
137–076	4,082,100
366–179	4,082,251
536–030	4,082,743
544–098	4,082,748
560–121	4,082,789
560–260	4,082,791
424–241	4,082,881
264–111	4,082,942
235–303.1	4,082,943
235–309	4,082,944
235–419	4,082,945
362–032	4,082,946
137–322	4,082,993

PATENTS

GRANTED APRIL 4, 1978

GENERAL AND MECHANICAL

4,081,864
SKI GLOVE OR MITT
Sandy Liman, Ketchum, Id., assignor to Scott USA, Inc., Sun Valley, Id.
Filed Sep. 13, 1976, Ser. No. 723,024
Int. Cl.[2] A63D *5/00*; A41D *19/00*
U.S. Cl. 2—161 A **12 Claims**

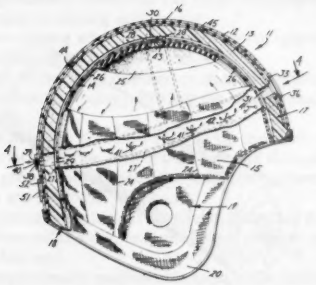


1. A ski glove or mitt capable of interlocking engagement with an extension of a ski pole grip which overlies a portion of a skier's hand, comprising:

a protective covering having a palmar region for engaging an elongated body of the ski pole grip, and other regions spaced from the palmar region including a thumb stall and a finger stall for containing one or more fingers of a skier's hand, and

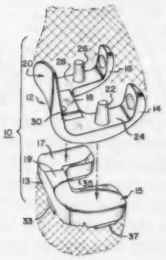
a raised padding secured to a portion of the other regions of the protective covering and containing a recess with a shape conforming at least in part to the shape of the extension on the ski pole grip, the recess snugly seating at least a portion of the extension to interlock the glove or mitt with the grip.

4,081,865
PROTECTIVE HELMET AND VENTILATING SYSTEM THEREFOR
Mark A. Bergee, 5808 Ashcroft Ave., Edina, Minn. 55424, and William K. Gilchrist, 5545 Warden Ave., Edina, Minn. 55436
Filed Jul. 8, 1977, Ser. No. 814,106
Int. Cl.[2] A63B *71/10*
U.S. Cl. 2—425 **10 Claims**



1. A protective helmet comprising a rigid outer protective shell, a relatively thick liner of cushioning material, a relatively thin inner cover on said liner, said shell, liner and inner cover defining crown, front, side and neck portions; a cushioning pad extending circumferentially about the interior of said inner cover and secured thereto; said inner cover and liner cooperating to define a circumferentially extending passage means around said front, side and neck portions; said inner cover defining a plurality of apertures extending between said passage means and the interior of the helmet; air inlet opening means in said front portion of the shell and liner and air outlet opening means in said neck portion of the shell and liner for communication with said passage means; and valve means for controlling movement of air through said inlet and outlet openings, passage means, and apertures.

4,081,866
TOTAL ANATOMICAL KNEE PROSTHESIS
Jackson E. Upshaw, Corpus Christi, Tex., and Charles Edward Meisch, Jersey City, N.J., assignors to Howmedica, Inc., New York, N.Y.
Filed Feb. 2, 1977, Ser. No. 764,844
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.911 **9 Claims**



1. A prosthetic knee joint comprising cooperating femoral and tibial components,

said femoral component having bone fixation means for implantation in the human femur and a pair of spaced condylar support members joined by an intercondylar segment, said condylar support members comprising a medial member and a lateral member, the longitudinal axis of said medial member being disposed at an anteriorly convergent angle of from about 3 to 7 degrees with respect to the longitudinal axis of said femoral component,

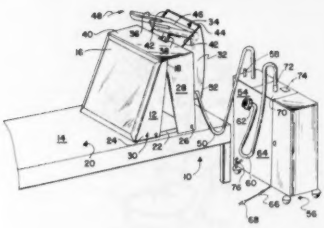
each of said condylar support members having a downwardly facing convex articulating surface with interior and exterior sides whose profile in transverse cross-section is defined by a circular arc extending upwardly to the interior side of said articulating surface and whose longitudinal cross-sectional configuration is defined by a condylar curve having at least three radii of curvature, each said curve comprising a central section and a pair of terminal sections, the radius of curvature of the posterior terminal section of each said curve being smaller than the radii of curvature of the central and anterior terminal sections of said curve, the condylar curve of said lateral member having at least one central portion radius of curvature larger than the central portion radii of said medial member,

said tibial component having bone fixation means for implantation in the human tibia and having a pair of spaced plateau members joined by an intercondylar eminence segment, said plateau members comprising a medial and lateral bearing surface, each with interior and exterior sides, wherein the longitudinal axis of the medial and lateral bearing members is disposed at an anteriorly convergent angle of from about 3° to 7° with respect to the longitudinal axis of said tibial component, said angle of convergence of each of said bearing members being substantially equal to the angle of convergence of said medial condylar support member, each of said bearing members having an upwardly facing concave articulating surface

for cooperating with the corresponding convex articulating surface of said condylar support member, defined by a circular arc whose radius of curvature is at least as large as the largest radius of curvature of said corresponding condylar support member, and

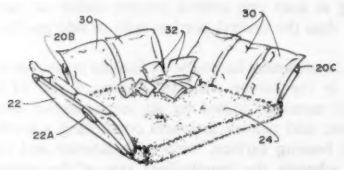
said plateau bearing surfaces each having in transverse cross-section a profile defined by a portion of a circular quadrant smoothly merging to a portion that is substantially horizontally tangent to said quadrant, said quadrant portion curving upwardly to the interior side of said bearing surface to form side walls for guiding the articulating movement of the condylar support members.

4,081,867
PORTABLE SHAMPOO UNIT
Mario J. Simeola, P.O. Box 617, Riverhead, N.Y. 11901
Filed Feb. 7, 1977, Ser. No. 766,076
Int. Cl.[2] A61H *35/00*; A47K *3/12*
U.S. Cl. 4—159 **5 Claims**



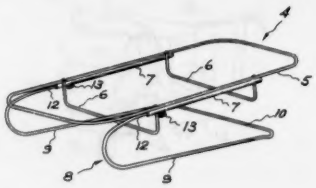
1. A portable shampoo unit for use on a horizontal surface comprising a back rest, a frame, the frame hingably secured to the back rest, the frame supporting the back rest in an inclined position with respect to the horizontal surface when the frame and the back rest are set up for use, a chamber, the chamber secured to the and frame having an open mouth portion extending upwardly and outwardly from the the frame being normal to said horizontal surface frame, a shampoo tray having a front and a rear region, means to pivotably secure the shampoo tray to the frame, the pivotable securing means including positioning the front region of the tray extending toward the back rest, the pivotable securing means including positioning the rear region of the tray into the open mouth portion of the chamber, means to bias the rear region of the tray towards the open mouth portion of the chamber.

4,081,868
ARTICLE OF FURNITURE
James R. Hull, 10910 Kinross Ave., Los Angeles, Calif. 90024
Filed Feb. 4, 1977, Ser. No. 765,434
Int. Cl.[2] A47C *7/20*
U.S. Cl. 5—12 R **5 Claims**



1. An article of furniture comprising: a rectangular bottom frame circumscribing a rectangular bottom area for the article; and plurality of side frames each comprising a U-shaped tubular member; coupling means connecting said side frames to said bottom frame to cause said side frames to define sides for the article slanting upwardly and outwardly from the plane of the bottom area; and pieces of fabric stretched over respective ones of the side frames and over respective ones of the portions of said bottom frame adjacent thereto.

4,081,869
INFANT'S CRADLE HOLDER
Richard Graham Ash, 59 The Serpentine, Avalon Beach, New South Wales, Australia
Filed Feb. 1, 1977, Ser. No. 764,692
Int. Cl.[2] A47D *9/00*
U.S. Cl. 5—105 **2 Claims**



1. An infant's cradle holder comprising:

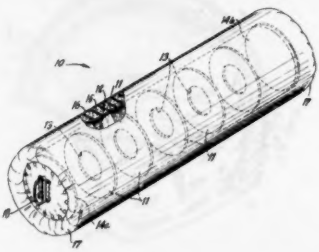
(a) a platform upon which an infant's cradle may be located, rested and retained, and which consists of a rectangular frame and at least two floor bars fixed to and depending from said frame,

(b) two socket tubes respectively fixed to the sides and extending longitudinally of said frame,

(c) a platform mounting, of resilient rod-like material, comprising a pair of U-shaped members having first limbs forming part of a base able to rest on a support surface, and second limbs adapted to be freely and respectively inserted in the socket tubes, and

(d) means to retain selected adjustment of said second limbs within said socket tubes.

4,081,870
BOLSTER FOR PHYSICAL THERAPY
Anthony Iannucci, 192 Chatterton Pkwy., White Plains, N.Y. 10606
Filed May 5, 1976, Ser. No. 683,496
Int. Cl.[2] A47G *9/00*; A61G *7/06*
U.S. Cl. 5—340 **5 Claims**



1. A light-weight bolster for physical therapy of handicapped individuals comprising:

a plurality of spaced intermediate supporting discs each having at least one aperture extending therethrough, and a pair of solid discs at the ends of the plurality of discs, one of said solid discs being spaced from the other discs at each end,

a layer of thin gauge metal wrapped circumferentially about said discs and fastened thereto, said metal being suffi-

ciently thin to permit ready handling by handicapped individuals,

a layer of foam rubber wrapped circumferentially about and adhered to said layer of thin gauge metal, said foam rubber layer being slightly longer than the distance between the solid end discs, and being folded over at its ends onto the end discs,

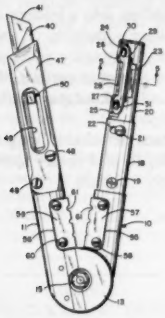
a layer of plastic material covering the foam rubber layer and being mounted to the solid end discs to hold the foam rubber layer in position and a layer of plastic material covering the exterior of the solid end discs, and, mounting means securing both the foam rubber layer to the solid end discs and the layer of plastic material thereto; the bolster further includes a handle mounted on at least one of the end discs to facilitate handling.

4,081,871

ELECTRICIAN'S WIRE STRIPPING TOOL

Everett F. Knuth, 814 - 16th Ave. NE., Rochester, Minn. 55901

Filed Apr. 4, 1978, Ser. No. 775,614
Int. Cl.² R26B *11/00*; H02G *1/12*
U.S. Cl. 7—107 **7 Claims**



1. A tool for stripping insulation from multiple conductor electrical cable comprising:

A. handle means adapted to be grasped in the palm of a hand and including a pair of arms pivotally connected at one end for opening and closing pincer movement,

B. a transverse groove in the inside edge of one of said arms adjacent the free end thereof,

C. longitudinally extending flat cable stripping blade means disposed overlying said groove,

1. the cutting edge of said blade being spaced from the bottom of said groove, and

2. said blade being disposed at an angle from about 45° to 60° from the plane including the longitudinal axes of the arms,

D. smooth cable hold-down means on the inside edge of the other of said arms adjacent the free end thereof, overlying said groove and spaced from said blade means when said arms are in closed position,

E. an internal longitudinal channel in said other arm adjacent the free end thereof, one end of said channel opening into said free end,

F. a longitudinally reciprocable knife blade holder disposed in said channel for reciprocation therein partially through said open end,

G. a flat knife blade in said blade holder,

H. a longitudinal slot in said other arm overlying said channel over part of its length, and

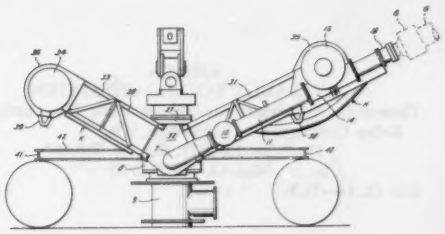
I. thumb actuating means associated with said blade holder and extending through said longitudinal slot for extending and retracting said holder and knife blade, said thumb actuating means being within normal reach of the thumb of the hand grasping the handle means, whereby the insulation may be stripped from one side of a cable and folded back and cut from the other side without disengaging the tool from the hand.

4,081,872

SUBMERGED SELF-STABILIZED CARGO HOSE ARM FOR A SINGLE POINT MOORING SYSTEM

Kristen I. Pedersen, Scarsdale, N.Y., and William L. Kiely, Houston, Tex., assignors to Sofec, Inc., Houston, Tex.

Filed Aug. 30, 1976, Ser. No. 718,459
Int. Cl.² B63B *21/00*; B65B *3/04*
U.S. Cl. 9—8 P **6 Claims**



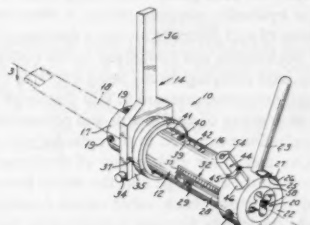
1. A single anchor leg mooring and cargo transfer system of the type described comprising anchor base means including a sea-floor base and a pipe shaft extending upwardly from said base, a cargo hose arm having a pivotal mounting on said pipe shaft and capable of swivelling action relative to said base means about horizontal and vertical axes, stabilizing structure having pivotal mounting on said base means and having lever arms extending oppositely from said pipe shaft, one of said lever arms supporting said hose arm, and buoyancy members carried by said lever arms for tending to maintain said hose arm and coupled hose in optimum position.

4,081,873

SELF-DECOUPLING TAP AND DIE HOLDER

Savarian F. Lemanski, 109 Taylor, Detroit, Mich. 48202

Continuation of Ser. No. 667,036, Mar. 15, 1976, abandoned.
This application Jul. 5, 1977, Ser. No. 812,666
Int. Cl.² B23G *5/12, 5/16*
U.S. Cl. 10—89 H **3 Claims**



1. A holder for a thread-forming tool, comprising a pair of coaxially telescoped members axially movable relative to one another, one of which members has means to mount said tool, said members having a torque-transmitting connection to one another enabling a predetermined relative axial slide of said members as said tool is threadingly engaged with a workpiece over a predetermined time interval, said connection being automatically discontinued after said interval whereby the tool-mounting member and workpiece have relative overrunning rotation, said torque-transmitting connection comprising a radially extending element on one member and an axially extending radial slot of predetermined length in the other

member which effectively opens at an end of the latter, the discontinuance of the connection occurring as said element reaches and departs the open end of said slot, and a plurality of longitudinally spaced opening means in said one member to receive and position said radially extending element at plural positions lengthwise of said slot to adjust the duration of said time interval, thus to vary the axial length of a thread formed by the tool.

4,081,874

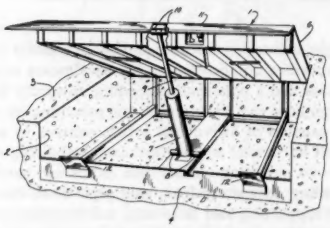
HYDRAULIC DOCKBOARD SYSTEM

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Jan. 12, 1977, Ser. No. 758,667

Int. Cl.[2] E01D *1/00*

U.S. Cl. 14—71.7 **8 Claims**



6. A hydraulic dock loading system, comprising a loading dock having a plurality of pits therein, a dockboard mounted in each pit with each dockboard including a supporting structure, a ramp hinged at its rear edge to the supporting structure and movable between a generally horizontal position and an upwardly inclined position, each dockboard including a hydraulic cylinder unit connected between the supporting structure and the ramp for raising the ramp from the horizontal position to the upwardly inclined position, said dockboards arranged in a series of groups with each group comprising a pair of dockboards, a single hydraulic pumping means, a reservoir connected to the inlet of said pumping means, a discharge line for each group of dockboards and connected to the outlet of the pumping means, said pumping means being operable to maintain a substantially constant pressure in said discharge lines, a return line for each group of dockboards and connected to the reservoir, a supply line connected to the cylinder unit of each dockboard, valve means for each group of dockboards and operably connecting the discharge line, the return line and the supply lines of that group, each valve means having a first position wherein the supply lines are connected to the return line whereby the ramps can float freely up and down during a loading operation, and having a second position wherein a first of said supply lines is connected to the discharge line and a second of said supply lines is connected to the return line whereby fluid is supplied to the cylinder unit associated with said first supply line to thereby elevate the corresponding ramp and the ramp associated with the second supply line is free to float and having a third position wherein said second supply line is connected to the discharge line and said first supply line is connected to the return line whereby fluid is supplied to the cylinder unit associated with said second supply line to thereby elevate the corresponding ramp and the ramp associated with the first supply line is free to float, and means for moving said valve means between said positions.

4,081,875

SCALE REMOVAL DEVICE

Eizo Nishino, 2-7-9, Sanno Yahata Higashi-ku, Kitakyushu-shi, Fukuoka-ken, Japan

Filed Nov. 10, 1976, Ser. No. 740,603

Claims priority, application Japan, Nov. 15, 1975, 50-155768[U]

Int. Cl.[2] B08B *9/04*

U.S. Cl. 15—104.06 R **6 Claims**

1. A scale removal device for scraping scale from the inner surface of tube sections, comprising, in combination,

a rotary shaft to be received coaxially in a tube section to be scraped,

a spiral blade secured to and around said shaft and extending along a substantial portion of the length of said shaft,

a center bore extending into a leading end of the shaft,

a scraper head having a plurality of resilient scraper blades extending radially outwardly and rearwardly in yielding abutment against the inner surface of the tube section,

said spiral blade and said scraper blades being of opposite hand,

and connector means detachably longitudinally connecting said scraper head to said rotary shaft for joint advancement and opposite rotation.

4,081,876

TOOTHBRUSHES

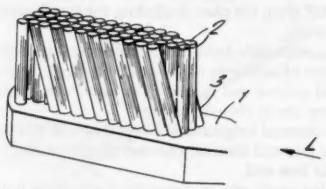
Brinley Roy Pugh, Tolworth, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 17, 1976, Ser. No. 742,607

Claims priority, application United Kingdom, Nov. 21, 1975, 48001/75

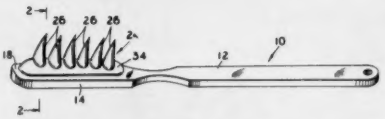
Int. Cl.[2] A46B *9/04*

U.S. Cl. 15—167 R **6 Claims**



1. A toothbrush having a longitudinally aligned handle and brushhead and within the brushhead four parallel longitudinal rows of filaments, of which the filaments in two rows extend perpendicular to said brushhead and the filaments in the other two rows, while substantially lying in longitudinal planes perpendicular to said brushhead, are inclined in the same longitudinal direction and relative to said perpendicular filaments and in which each row of filaments lies adjacent a row whose filaments are inclined relative to the filaments in that row.

4,081,877
GUM MASSAGING IMPLEMENT
Ben Vitale, 1302 83rd St., Brooklyn, N.Y. 11228
Filed Sep. 23, 1976, Ser. No. 725,790
Int. Cl.[2] A46B 9/04
U.S. Cl. 15—188 3 Claims



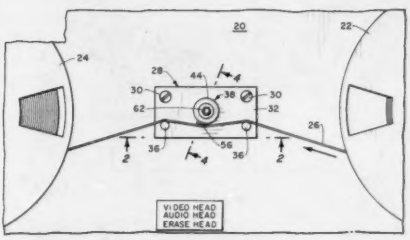
1. A gum massaging device including a handle having a toothbrush head insert retaining portion on one end thereof in the form of a recess wherein said recess is bounded by a bottom surface and four upwardly extending side walls, said toothbrush head insert comprising:

(a) a flexible resilient base element affixed within said recess, said base element including a bottom surface, four sides of a predetermined depth, and a rounded upper surface;

(b) a single longitudinally aligned row of vertically disposed, similarly flexible, resilient conically shaped massage elements affixed to the said rounded upper surface of said base element along the central longitudinal axis and inwardly of the longitudinal sides of said base element, wherein each of said conically shaped massage elements include a base and a height dimension wherein said base dimension is about one-third the magnitude of said height dimension; and

(c) a relationship between the height of said base element and the height dimension of each of said conically shaped massage elements wherein said height of said base element has a magnitude of about one-half of said height dimension said head insert being integrally formed.

4,081,878
TAPE CLEANING DEVICE
William H. Seidel, and Ralph B. McDaniel, both of Canoga Park, Calif., assignors to N.O.V.A. Corporation, Canoga Park, Calif.
Filed Nov. 13, 1975, Ser. No. 631,504
Int. Cl.[2] B08B 1/02; G11B 3/58
U.S. Cl. 15—256.5 11 Claims

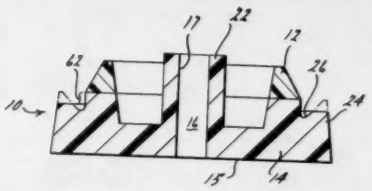


1. In combination with a video tape recorder having a recorder housing upon which is mounted a recording head, a playback head, a supply reel and a take-up reel for magnetic tape, a tape cleaning device mounted on said recorder housing in the path of said magnetic tape, said device comprising:

a tape cleaning block constructed of a material of extreme hardness, said block having at least one angularly formed elongated sharp edge, said sharp edge to contact said magnetic tape to effect cleaning thereof, said block having an internal granular pattern extending in a given direction, said direction of said granular pattern being located at substantially a right angle to said magnetic tape;

mounting means for fixedly mounting said block upon said housing, said mounting means including structure enabling said block to be removed for subsequent remounting of said block in a different position within said mounting means.

4,081,879
SEALING MEMBER
Phillip L. Rubright, Berkley, Mich., assignor to Chemcast Corporation, Detroit, Mich.
Filed Jan. 28, 1976, Ser. No. 653,268
Int. Cl.[2] B65D 55/00
U.S. Cl. 16—2 17 Claims



1. A grommet for sealing an opening in a panel, said grommet comprising

an annular base portion having a continuous circumferential and axial extending sealing band surface,

an annular locking portion having a continuous circumferential and axial extending ridge portion approximately the same diameter as said sealing band surface,

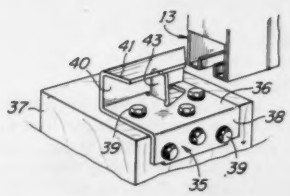
said sealing band surface constituting an axial extending continuation of said ridge portion,

said locking portion and said base portion being in contact with each other and integrally bonded together,

said base portion comprising an elastomeric material and said locking portion being more rigid than said base portion,

whereby when the grommet is installed in a panel opening, the locking position is inserted through the opening to a position on the opposite side of the panel from the base portion locking the grommet in place, and said sealing band surface forms a complete seal continuously around the entire inner periphery of the panel opening.

4,081,880
LOWER GUIDE FOR HORIZONTALLY SLIDING DOOR
James A. Edeus, Rock Falls, Ill., assignor to National Manufacturing, Co., Sterling, Ill.
Filed Nov. 10, 1976, Ser. No. 740,254
Int. Cl.[2] A47H 15/00; E05D 13/02
U.S. Cl. 16—90 8 Claims



1. A lower guide for a pair of biparting sliding doors, comprising

a member having a mounting plate portion adapted to be secured to a supporting surface

said member having an upstanding flange

the upper end portion of said flange being bent over to provide a laterally extending lip, and

a stop extending laterally from said member adjacent said flange and below said lip.

4,081,881

FOLDING CLOSURE

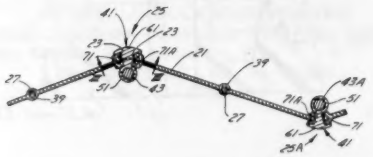
Cerge Rudolf Maxime Lamarre, Pointe Claire, Canada, assignor to R. Labelle, Brossard, Canada

Filed Jul. 12, 1976, Ser. No. 704,411

Claims priority, application Canada, Jan. 22, 1976, 244067

Int. Cl.[2] E05D *3/04*

U.S. Cl. 16—162 **9 Claims**



1. A hinge member comprising an elongated main body, a longitudinal opening in the main body for receiving a hinge pin, an elongated facing wall spaced from the main body, a web extending radially from the main body to the longitudinal center of the wall to connect the wall to the body, and connecting means on one side of the web for use in connecting a panel member to a hinge employing the hinge member.

4,081,882

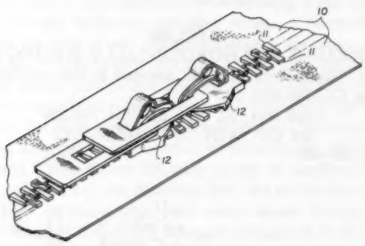
LOCKING ZIPPER SLIDER, AND ZIPPER INCORPORATING SAID SLIDER

Werner Toepelt, Old Greenwich, Conn., and Richard Bernier, Uniondale, N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 738,161

Int. Cl.[2] A44B *19/26*; E05B *67/38*

U.S. Cl. 24—205 R **9 Claims**



1. In a slider assembly for a zipper, wherein the slider has a U-shaped projection with one arm thereof fixed to and extending from one face thereof at the leading edge of the slider, the other arm of the projection extending toward the trailing end of said slider, a slider pull having only a single aperture through which said projection extends, the other arm of said projection being spaced from said face a distance less than the thickness of said slider pull, whereby said pull is loosely held to said slider; the improvement wherein said aperture in said pull has a length greater than the lengthwise dimension of said U-shaped projection, and said U-shaped projection has a locking hole extending transversely therethrough.

4,081,883

LOCKING SLIDER FOR SLIDING CLASP FASTENERS

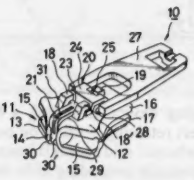
Susumu Ishii, and Tuneo Suzuki, both of Kurobe, Japan, assignors to Yoshida Kogyo K.K., Japan

Filed Mar. 16, 1977, Ser. No. 777,950

Claims priority, application Japan, Mar. 19, 1976, 51-33227[U]

Int. Cl.[2] A44B *19/30*

U.S. Cl. 24—205.14 R **2 Claims**



1. An automatic locking slider of the class described comprising a slider body having an upper wing member and a lower wing member positioned in spaced, opposed relation and connected at one end by an integral neck portion to provide a substantially Y-shaped channel therebetween, a locking spring member formed from a strip of stainless steel and supported on said upper wing member, and a pull tab having a transversely extending trunnion pivotally disposed between said locking spring member and said upper wing member, said locking member having a first section secured to the slider body adjacent said neck portion and a second section including a locking prong movable into and out of said Y-shaped channel, said first section having a groove formed by cold press and being higher in the cold rolling modulus at an area adjacent to said groove than said second section.

4,081,884

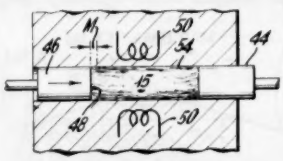
METHOD FOR MAKING DIMENSIONALLY STABLE ARTICLES

Wolfgang Johst, Gevelsberg; Axel Friese, Wuppertal, both of Germany, and Stefan Simon, Moedling, Austria, assignors to Dr. Carl Hahn, GmbH, Dusseldorf, Germany

Filed May 11, 1977, Ser. No. 795,975

Int. Cl.[2] D04H *1/22*; A61F *13/20*

U.S. Cl. 28—119 **10 Claims**



1. A method for providing a relatively dimensionally stable absorbent body comprising compressed cellulosic fibers, said method comprising the steps of:

radially compressing a generally cylindrical blank comprising said cellulosic fibers, said radially compressed blank having a length in excess of the desired finished length;

introducing said blank into a chamber having heated walls;

axially compressing said blank to a length less than the desired finished length by continuously applying a force against at least one end of the blank while the sides and other end are held confined within said heated chamber;

releasing said force to the extent necessary for said blank to expand in length to the desired length; and

immediately upon having the blank expanded to said desired length, continuously maintaining a force resistant to further expansion against said one end of the blank while still

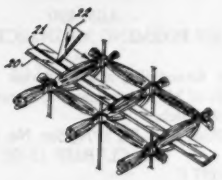
maintaining said blank within the confines of said heated chamber until said blank attains the desired dimensional stability.

4,081,885

METHOD OF MAKING A TEXTILE PRODUCT

Lee R. Shank, 18211 N. 35th Ave., Phoenix, Ariz. 85032

Filed Sep. 1, 1976, Ser. No. 719,459
Int. Cl.[2] D04D *7/04*
U.S. Cl. 28—149 1 Claim



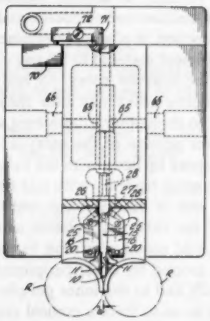
1. A method of making a textile article comprising the steps of forming a backing web by positioning textile strands transversely between the sides of the loom, extending multiple strands of yarn between the sides of the loom in alignment with the textile strands, providing securements of the yarn strands to the textile strands at the intersections thereof, including the step of providing the securements at the said intersections by way of strings extending diagonally between intersections, cutting the yarn strands between secured intersections while leaving the web backing and diagonal strings intact whereby the cut strands of yarn can form rosettes, including the step of inserting a cutting stick in a longitudinal position between parallel aligned yarn strands on one side and textile strands and diagonal strings on the other, and cutting yarn strands by moving a cutting blade along said stick without cutting the textile strands and diagonal strings and guiding the blade solely by holding it against an edge surface on the cutting stick.

4,081,886

METHOD FOR CRIMPING YARN

John S. Roberts, Ellicott, Md., assignor to Kling-Tecs, Inc., Columbia, Md.

Division of Ser. No. 446,175, Mar. 13, 1974, Pat. No. 3,934,226. This application Oct. 14, 1975, Ser. No. 621,992
Int. Cl.[2] D02G *1/12*
U.S. Cl. 28—251 4 Claims



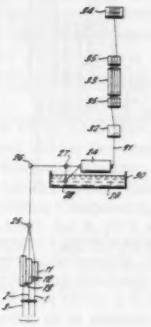
1. A method of crimping drawn yarn the denier of which varies from yarn end to yarn end and along the length of any yarn end comprising feeding the yarn into a crimping head to form a plug of yarn, retaining the mass of the yarn plug substantially constant by applying a uniform pressure only to the sides of the plug downstream of the trailing end of the plug while permitting the plug to advance past the area of pressure application as the yarn enters the crimping head and is crimped at the trailing end of the plug thereby crimping the yarn of lower denier to higher crimp levels than the yarn of higher denier and taking up the thus crimped yarn onto packages.

4,081,887

PRODUCTION OF BULKY, CONTINUOUS FILAMENT YARN

Gordon Alan Holden, Vine Acre, Wales, assignor to Crimpfil Limited, Aberbargoed, Bargoed, Wales

Continuation-in-part of Ser. No. 541,355, Jan. 15, 1975, Pat. No. 4,000,551. This application Dec. 16, 1976, Ser. No. 751,408
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—271 13 Claims



1. A method of producing bulky, continuous filament yarn in which a primary continuous multi-filament yarn of polymeric material comprising at least 20% of the total filaments and having filaments which are substantially straight and free from crunodal ring-like loops and a secondary continuous multi-filament yarn of polymeric material comprising up to 80% of the total filaments and having filaments which are formed at randomly spaced longitudinal intervals with crunodal ring-like loops separated by relatively straight portions and are intermingled with each other and with the substantially straight filaments of the primary yarn so that, when a gradually increasing tensile load is imposed on the bulky yarn, the filaments of both the primary and secondary yarns break simultaneously; the method including the steps of:

pre-treating at least one of the primary and secondary continuous multi-filament yarns by the application of an aqueous liquid;

feeding the primary and secondary yarns into a treatment zone so that each yarn to which the aqueous liquid has been applied enters the treatment zone while still wet;

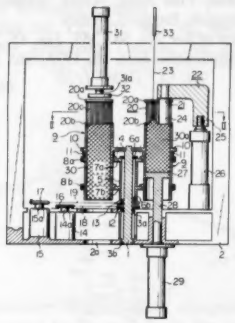
providing within the treatment zone a fluid flow of sufficient turbulence to separate the individual filaments of the yarns, to form crunodal ring-like loops and other convolutions at randomly spaced intervals along the lengths of the individual filaments of each secondary yarn, and to cause the individual filaments of each secondary yarn to intermingle with each other and with the individual filaments of each primary yarn to form a single bulky yarn;

withdrawing the intermingled filaments from the treatment zone at a rate such that each primary yarn is fed into the treatment zone at a rate between 4% and 26% higher than the rate at which the intermingled filaments are withdrawn from the treatment zone and each secondary yarn is fed in to the treatment zone at a rate which is at least 2.5% higher than the rate of feed of each primary yarn and up to 30% higher than the rate at which the intermingled filaments are withdrawn from the treatment zone.

4,081,888
APPARATUS FOR PRODUCING COMPACT YARN PACKAGE

Katsumi Hasegawa, Kusatsu; Toru Nakanishi, Otsu, and Toshihiko Oka, Moriyama, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 23, 1977, Ser. No. 780,690
Claims priority, application Japan, Mar. 26, 1976, 51-32415
Int. Cl.[2] B65H *54/84*
U.S. Cl. 28—285 16 Claims

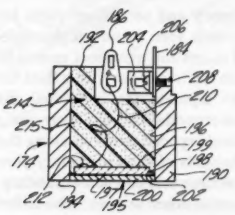


1. An apparatus for producing a compact package of a textile yarn, comprising an accumulation container disposed to a machine frame in a rotatable condition about a longitudinal axis thereof, an inlet of a textile yarn formed a position above said accumulation container in an eccentric condition to said longitudinal axis of said accumulation container, a compression means provided with a pressing head capable of being insered into said accumulation container, said pressing head being capable of reciprocally displacing up and down along said longitudinal axis of said accumulation container in such a condition that the working position of said pressing head is eccentric from said longitudinal axis of said accumulation container.

4,081,889
METHOD FOR MANUFACTURING AN ULTRASONIC TRANSDUCER

Walter E. Levine, Port Huron, Mich., assignor to Bindicator Company, Port Huron, Mich.

Division of Ser. No. 560,245, Mar. 20, 1975, Pat. No. 4,015,319.
This application Nov. 12, 1976, Ser. No. 741,310
Int. Cl.[2] H01L *41/22*
U.S. Cl. 29—25.35 5 Claims



1. For use with an ultrasonic transducer having a preselected resonant frequency f_0, and comprising an open hollow shell and a vibratory element including a piezoelectric crystal mechanically coupled to said shell at one open end thereof, the method of lowering the Q of said transducer comprising the steps of:

(a) measuring the Q of said transducer at said preselected resonant frequency,

(b) preparing a mixture of RTV and a nonconductive particulate material in a predetermined weight ratio, said ratio depending on the measured Q and a desired final Q value,

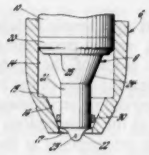
(c) pouring said mixture into said shell at an open end thereof remote from said one end, and

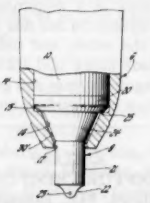
(d) curing said mixture within said shell, whereby the Q of the transducer is lowered to the desired final value.

4,081,890
METHOD OF FORMING AN INJECTOR VALVE NUT SEAL

Elmer Bluhm, Grandville, and Frederick T. Vaas, Jr., Grand Rapids, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 21, 1976, Ser. No. 688,693
Int. Cl.[2] B23P *15/00*
U.S. Cl. 29—157 C 1 Claim





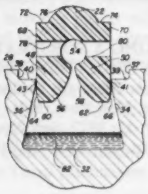
1. A method of forming in place a ring seal in the clearance space between the outer peripheral conical surface of an injector spray tip body and the inner peripheral conical surface of a sleeve type valve nut in a unit fuel injector, said method including the steps of forming an annular substantially flat ring of rectangular cross-section and of ductile material which, when viewed in cross-section, is of a predetermined shape and size so as to provide sufficient material to fill any clearance space that exists between the injector spray tip body and the interior surface of the sleeve valve nut after they are in assembled position relative to each other, positioning said ring to slidably encircle the lower portion of the spray tip body prior to the assembly of the spray tip body with the valve nut, inserting the lower end of the spray tip body with said ring thereon through the lower open end of the valve nut and then effecting axial displacement of the valve nut relative to the spray tip body thereby causing said rectangular ring to move and to become formed in place around the outer peripheral conical surface of the spray tip body and to the inner peripheral conical surface in the valve nut so as to form a conical ring seal in the clearance space therebetween with one surface of the ring seal in sealing abutment against the outer peripheral conical surface of the spray tip body and at its other side in sealing abutment against the inner peripheral surface of the valve nut and forming an upper seal by contacting surfaces on said spray tip body and said valve nut, said conical ring seal preventing corrosive materials from being transmitted to said upper seal.

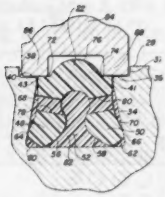
4,081,891

METHOD OF MAKING A VALVE

Bertram L. Morrison, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 644,233, Dec. 24, 1975, Pat. No. 4,034,959.
This application Apr. 13, 1977, Ser. No. 787,173
Int. Cl.[2] B23P *15/00*; F16K *3/02*; B32B *1/10, 1/06*
U.S. Cl. 29—157.1 R 1 Claim





1. A method of making a seat structure for a valve having a body with a passageway therethrough, a cavity in said body, a valve member mounted in said cavity for movement between open and closed positions relative to said passageway, comprising the steps of:

first forming a groove in a seal ring supporting portion of said valve body about the passageway with the groove having divergent side walls,

then partially filling the groove with a chemical fastener material,

next inserting an annular resilient seal ring having a lateral passageway between opposed sides thereof within the groove adjacent the divergent side walls and into the chemical fastener material so that the chemical fastener material flows through the lateral passageway and between the side walls and adjacent sides of the resilient seal,

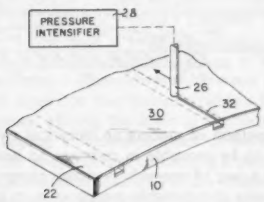
and curing the chemical fastener material in said groove and said lateral passageway for a predetermined time until the seal ring is anchored within said groove between the divergent side walls thereof.

4,081,892

METHOD OF MAKING COMPOSITE STRUCTURE

John E. Mercer, Kent, Wash., assignor to Flow Industries, Inc., Kent, Wash.

Filed Nov. 1, 1976, Ser. No. 737,738
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—421 R 15 Claims



1. A method of making a composite structure, such as an air foil, comprising a base member and a sheet member, secured one to the other and defining therebetween a chamber area, such as an air plenum, and a precision opening communicating through the sheet with the chamber area, such as a boundary layer air suction opening for the air foil, said method comprising:

a. providing a base member and a sheet member of a predetermined configuration,

b. joining the base member and sheet member one to another to form a composite structure with a chamber area defined by a portion of the sheet member and a portion of the base member,

c. also providing in said chamber area a shield member positioned between said sheet portion and said base member portion, and

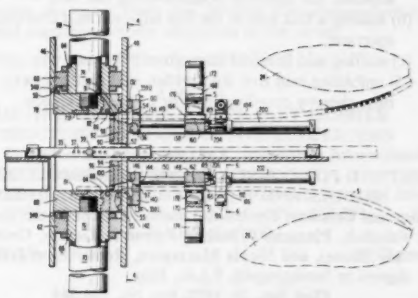
d. directing a high velocity fluid jet against an exterior surface of said sheet portion to form an opening therethrough, said fluid jet being oriented in a direction to impact said shield member after passing through said sheet portion.

4,081,893

METHODS FOR FORMING WOODEN JOINTS

John Calvin Jureit, Coral Gables; Roy Leutwyler, Miami; Larry Brodsky, Sunrise; Benjamin Kushner, Miami; Andrew G. Seipos, Miami, and Adolfo Castillo, Miami, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Division of Ser. No. 594,247, Jul. 9, 1975, abandoned, which is a division of Ser. No. 509,567, Sep. 26, 1974, Pat. No. 3,964,663.
This application Aug. 4, 1976, Ser. No. 711,499
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432 7 Claims



1. A method of joining a pair of longitudinally aligned end to end butting wooden members by applying a sheet metal connector plate of the type having integrally struck teeth projecting from one side thereof to joints formed between the wooden members comprising the steps of:

(1) providing a coil of connector stock of the type having integrally struck teeth projecting from one side thereof;

(2) feeding the connector stock from the coil to a presshead which is movable along a predetermined path and carries a cutting edge for cutting the stock as the presshead moves along the said path, thereby to form a connector plate of predetermined length;

(3) aligning a stop at a predetermined position relative to said predetermined path for said presshead;

(4) locating the joint between the longitudinally aligned end to end butting wooden members in opposition to the path of movement of said presshead by butting the leading end of trailing wooden member against said stop;

(5) clamping the said wooden members in the said longitudinally aligned butting end to end relation;

(6) moving said presshead in said predetermined path and cutting the stock to form a connector plate of predetermined length; and

(7) upon further movement of the presshead, pressing the

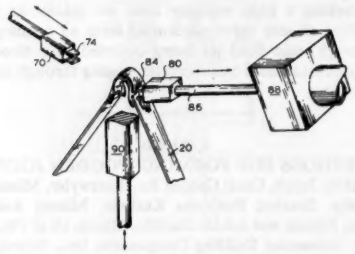
teeth of the connector plate thus formed into one side of the adjoining wooden members.

4,081,894

METHOD FOR ATTACHING A WORKPIECE TO A CONTINUOUS LENGTH OF LINE

Gerald Peter Hermanson; David Murray Rickel, both of Maitland, and Robert Joseph Carr, Winter Park, all of Fla., assignors to Dayron Corporation, Orlando, Fla.

Division of Ser. No. 694,243, Jun. 9, 1976, Pat. No. 4,017,955.
This application Apr. 14, 1977, Ser. No. 787,353
Int. Cl.² B23P *19/04*
U.S. Cl. 29—433 **10 Claims**



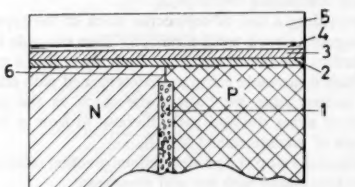
1. A method for coupling one way apertures of a workpiece to a specified position along a continuous length of line, said method comprising the steps of:
(a) positioning a first one way aperture in the workpiece adjacent the specified position along the line;
(b) making a first fold in the line adjacent said first one way aperture;
(c) stuffing said first fold through said first one way aperture;
(d) unfolding said first fold within said first one way aperture, thereby coupling the line to the workpiece.

4,081,895

METHOD FOR CONSTRUCTING A THERMOELECTRIC MODULE AND THE MODULE SO OBTAINED

Giovanni Germano; Francesco Losciale, both of Rome; Roberto Falesiedi, Piansano (Viterbo); Ferruccio Daclon, Grottaferrata (Rome), and Nicola Merzagora, Rome, all of Italy, assignors to Snamprogetti, S.p.A., Italy

Filed Sep. 20, 1976, Ser. No. 724,544
Claims priority, application Italy, Sep. 30, 1975, 27777 A/75
Int. Cl.² B01J *17/00*
U.S. Cl. 29—573 **2 Claims**



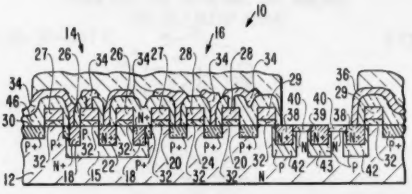
1. A method for constructing a thermoelectric module, comprising the following operations:
(a) constructing a reference shoulder on the semiconductor bar by an ultrasonic perforator;
(b) assembling the semiconductor bars in series, using a cement of insulating properties;
(c) cleaning the surfaces by sandblasting;
(d) gold plating to a thickness of 1 μ by metalisation;
(e) nickel plating to a thickness of 0.01 – 0.03 mm using a Watts bath;
(f) brasing copper electrodes under vacuum using a welding alloy consisting of Au, Ag, Ga;
(g) machining the regions between elements which have to remain isolated using an ultrasonic perforator;
(h) protecting the copper electrodes by nickel or chromium plating.

4,081,896

METHOD OF MAKING A SUBSTRATE CONTACT FOR AN INTEGRATED CIRCUIT

Andrew Gordon Francis Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,246
Int. Cl.² B01J *17/00*
U.S. Cl. 29—590 **5 Claims**



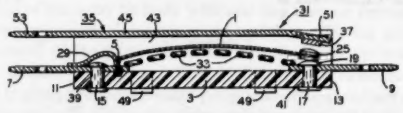
1. A method of making electrical contact to the substrate of a COS/MOS integrated circuit having a surface comprising the steps of:
(a) forming at least one highly conductive region in said surface which extends into a well region of opposite type conductivity to said substrate and separated from said substrate by said well region, said highly conductive region being of the same conductivity type as said substrate;
(b) altering the electrical characteristics of at least a portion of said well region which is contiguous with said substrate and with said conductive region, by ion bombardment to convert its conductivity to that of said conductive region, thus forming a continuous current path whereby current will flow in either direction between said highly conductive region and said substrate; and
(c) making electrical contact to said highly conductive region.

4,081,897

METHOD OF MAKING AN ELECTRIC SWITCH

Edward O. Andersen, Rock Falls, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 477,828, Jun. 10, 1974, Pat. No. 3,968,468.
This application Apr. 2, 1976, Ser. No. 672,851
Int. Cl.² H01H *11/00*
U.S. Cl. 29—622 **20 Claims**



1. A method of making an electrical switch having means adapted to be movable in response to heat supplied thereto between a pair of operable positions comprising the steps of:
a. heating the movable means so as to effect its deflection into a predetermined curvature in one of the operable positions and securing an integral part of the movable means against movement while the movable means is

deflected in the predetermined curvature thereof in the one operable position;

b. forming a means adapted for heating the movable means with a curvature generally complementary to the predetermined curvature of the movable means in the one operable position; and

c. disposing the heating means closely adjacent to the movable means so that the complimentary curvature of the heating means generally approximates the predetermined curvature of the movable means only when the movable means is deflected into the one operable position.

4,081,898

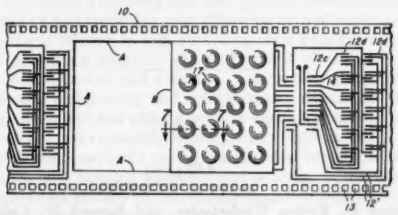
METHOD OF MANUFACTURING AN ELECTRONIC CALCULATOR UTILIZING A FLEXIBLE CARRIER

James B. Taylor, Jr., Plano, and Galen F. Fritz, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 678,103, Apr. 19, 1976, abandoned. This application May 5, 1976, Ser. No. 683,366

Int. Cl.² H01H *11/00*

U.S. Cl. 29—622 **26 Claims**



1. A method of manufacturing an electronic calculator comprising:

(a) forming a pattern of conducting stripes on a flexible substrate;

(b) forming a plurality of indentations in said substrate intersecting selected portions of said conducting stripes in said pattern;

(c) folding a portion of said substrate back on itself to form a keyboard utilizing the indentations and selected conducting stripes as keyboard switches; and

(d) connecting a tape-mounted semiconducting device and a display device to said flexible substrate.

4,081,899

METHOD OF PRODUCING A SEALED ELECTROLYTE-LIMITED LEAD-ACID BATTERY

Roy F. Thornton, and Joseph L. Weininger, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,469

Int. Cl.² H01M *2/36*

U.S. Cl. 29—623.2 **3 Claims**

1. A method of producing a sealed electrolyte-limited lead-acid battery which comprises providing a container having a body portion and a cover with at least one opening therein, providing at least one positive plate, providing at least one negative plate, positioning a separator therebetween, positioning the plates with separator therebetween within the body portion of the container, affixing the cover to the body portion of the container, adding a limited amount of sulfuric acid electrolyte within the body portion containing a metallic sulfate in an amount equivalent to from 0.01 to 2.5 weight percent sodium sulfate, forming charged positive and negative plates therein, retaining within the body portion the limited amount of sulfuric acid electrolyte containing the metallic sulfate, and sealing the battery.

4,081,900

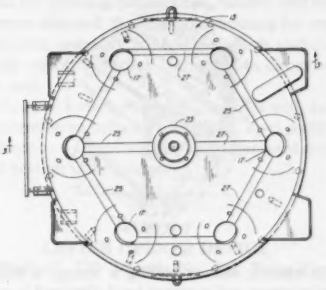
METHOD OF FORMING COVERS FOR ELECTRICAL EQUIPMENT

Richard R. Boni, McMurray, and Joseph J. Janubetz, Canonsburg, both of Pa., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Sep. 30, 1976, Ser. No. 728,501

Int. Cl.² H01B *13/00*

U.S. Cl. 29—624 **7 Claims**



1. A method of forming a cover for an electrical equipment casing comprising the steps of:

determining a portion of flat sheet material having a relatively high magnetic permeability to be utilized in constructing the cover;

replacing selected segments of said portion with material having low magnetic permeability; and

forming the cover from said portion after replacement of said segments without distortion of the cover.

4,081,901

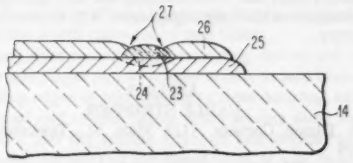
METHOD OF MAKING A TERNARY BARRIER STRUCTURE FOR CONDUCTIVE ELECTRODES

Lewis F. Miller, LaGrangeville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 535,261, Dec. 23, 1974, Pat. No. 4,017,889. This application Feb. 4, 1977, Ser. No. 765,551

Int. Cl.² H01R *43/00*

U.S. Cl. 29—630 R **10 Claims**



1. The method of forming a barrier structure on a conductive electrode comprising:

providing on a substrate a conductive electrode composed of predominently silver and a lesser quantity of one or more of a platinum group metal;

depositing over a portion of said electrode a homogeneous mixture comprising a gold powder and a finely divided material which upon heating to an elevated temperature will coalesce and upon cooling form a continuous layer;

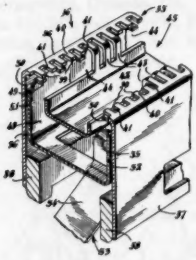
heating and composite to said elevated temperature to cause said coalescence and for a time to cause a diffusion of a portion of said gold into said portion of the electrode wherein a gold-silver-platinum group metal alloy is formed therein; and

cooling said composite.

4,081,902
CUTTER HEAD ASSEMBLY FOR AN ELECTRIC DRY SHAVER

David Richard Locke, Bridgeport, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed Dec. 7, 1976, Ser. No. 748,611
Int. Cl.[2] B26B *19/04*
U.S. Cl. 30—43.92 12 Claims



7. In an electric shaver having a casing, a motor driven cutter drive means and a cutter head disposed in said casing, said cutter head including an elongated inverted U-shaped stationary cutter member, a movable inner cutter mounted within said cutter member in hair shearing engagement therewith and operable by the drive means, said cutter member comprising,

a. an elongated bight portion having a width defined by a pair of spaced longitudinally extending opposed sidewalls depending from and formed perpendicular to said bight portion,

b. longitudinally extending ledges having continuous coplanar surfaces formed from said bight portion coextensive with said sidewalls,

c. an elongated hair receiving opening formed in said bight portion and extending longitudinally of said cutter member, said opening occupying a substantial portion of the width of said bight portion, said opening forming a passage into the interior of said cutter member,

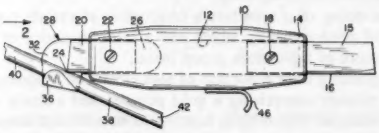
d. a plurality of hair combing teeth formed in said ledges extending in the direction of said opening, said teeth terminating in leading edges adjacent said opening, and

e. said teeth each having skin engaging surfaces formed on the same plane as the continuous coplanar surfaces of said ledges for stretching the skin in advance of the movable inner cutter, said teeth combing hair into said opening for passage into shearing engagement with the movable inner cutter.

4,081,903
CABLE STRIPPER

Joseph Tilmon Cormier, 1130 Main St., Tewksbury, Mass. 01876

Filed Jun. 25, 1976, Ser. No. 699,983
Int. Cl.[2] B21F *13/00;* B26B *27/00*
U.S. Cl. 30—90.6 4 Claims



1. A cable stripper comprising an elongated handle having a passage therethrough, a cable slitting blade located in said passage and extending from an end thereof, said blade having an exposed sharpened point,

a cable guide comprising a tang in said passage aligned with said blade in said passage, said tang having a laterally extending portion outside said passage, said laterally extending portion being directed away from said point, a downwardly and forwardly extending portion on the laterally extending portion spaced from said blade, said forwardly and downwardly extending portion including a transverse floor thereon at a point spaced from said sharpened point, and an upwardly directed cable guide portion terminating the floor,

and releasable means securing the blade and cable guide to the handle,

said floor being slightly inclined with relation to said cable stripping blade,

the releasable means comprising a single screw fastener extending through one side of the passage and laterally abutting the side of one of said cable stripping blade and said cable guide tang for forcing both of the latter elements against the opposite side of said passage thereby securing said cable stripping blade and cable guide in longitudinally adjusted position,

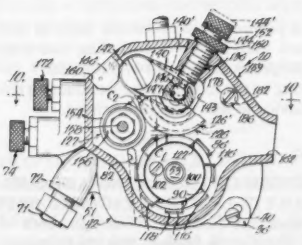
the blade and the guide being longitudinally adjustable relative to each other, and

said cable stripping blade and the cable guide being separate and removable from the handle.

4,081,904
ROVING CUTTER

Duane D. Krohn, Westminster, and Samuel W. Culbertson, Arvada, both of Colo., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Division of Ser. No. 586,206, Jun. 12, 1975, Pat. No. 4,001,935.
This application Oct. 26, 1976, Ser. No. 735,539
Int. Cl.[2] B26B *17/00*
U.S. Cl. 30—128 6 Claims

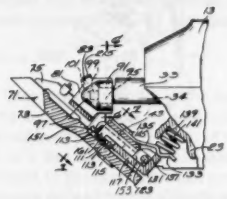


1. In a roving cutter having a rotatable cutter roller, a rotatable back-up roller cooperating with said cutter roller, and an idler roller cooperating with said back-up roller for feeding roving between said cutter roller and said back-up roller, the improvement comprising means adjustably mounting said back-up roller for movement into engagement with both of said cutter and idler rollers and in substantially equal increments away from both of them, and positive displacement adjusting means connected with said mounting means for fixing the position of said back-up roller relative to said cutter and idler rollers, said adjusting means including manually operable means remote from said rollers for adjusting said back-up roller while the cutter is operating, whereby the clearance between said idler and back-up rollers remains substantially equal to and varies substantially equally with the clearance between said cutter and back-up rollers.

4,081,905
ELECTRIC CLIPPER

Richard L. Urbush, Racine, Wis., assignor to Andis Clipper Co., Racine, Wis.

Division of Ser. No. 572,056, Apr. 28, 1975, Pat. No. 3,992,778.
This application Apr. 21, 1976, Ser. No. 678,927
Int. Cl.² B26B *19/06*
U.S. Cl. 30—221 14 Claims

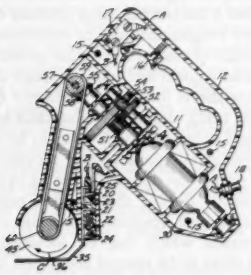


1. A hair clipper comprising a housing assembly including a recess, a blade set having a stationary blade with means thereon defining a groove, a blade set mounting assembly including a mounting plate fixed to said housing assembly, a tongue removably extending into said groove, means on said tongue and on said mounting plate affording pivotal movement of said tongue relative to said mounting plate between a first position permitting insertion and withdrawal of said tongue relative to said groove and a second position preventing such insertion and withdrawal, and spring means secured to said mounting plate and including a portion engaging said tongue for selectively and releasably holding said tongue in said first and second positions, and a spring in said recess bearing, at one end, against said housing assembly and bearing, at the other end, against said portion of said spring means to augment the action of said spring means.

4,081,906
CAST CUTTER

Thelma G. Sigler, Orange, Calif., assignor to Alpha Nova Development Corporation, Santa Ana, Calif.

Filed Apr. 28, 1977, Ser. No. 791,865
Int. Cl.² B26B *7/00*
U.S. Cl. 30—276 8 Claims

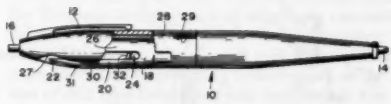


1. A portable cutter assembly adapted for use in removing casts from the body of a patient, comprising:
- an electrically driven motor adapted for connection to an electric power source;
- gearing coupled to the output of said motor;
- a first housing conformed to receive said motor and said gearing;
- a second housing extending from said first housing and communicating on the interior therewith;
- a first and a second rotary cutter mounted for rotation in said second housing, said first and second rotary cutters having cutting edges partially exposed therefrom, said first and second cutters being aligned at a toe in and positive caster relative each other symmetrically about a longitudinal plane intersecting said first and second housing;
- pulley means disposed on the interior of said first and second housing for transferring rotary power between said gearing and said first and second rotary cutter;
- a bottom plate assembly telescopically received within said second housing and extending outwardly therefrom to align distally subjacent of said exposed edges of said first and second cutters said bottom plate assembly being adapted for telescopic translation relative said cutters;
- spring means disposed in said second housing for urging said bottom plate assembly upwardly towards said cutters;
- a manually operative switch connected in circuit with said motor; and
- a normally open switch connected in series with said manually operative switch, said normally open switch being articulated to a closed state by the downward articulation of said bottom plate assembly.

4,081,907
LETTER OPENER DEVICE

Barry L. Bosshold, 220 Atlantic No. 209, Santa Cruz, Calif. 95062

Filed Aug. 9, 1976, Ser. No. 712,585
Int. Cl.² B26B *29/00*
U.S. Cl. 30—294 6 Claims



1. A letter opener comprising:
- a non-cutting finger having a relatively pointed distal end to be inserted under the flap of a sealed envelope and tapering gradually outward to a wider trailing portion displaced from said distal end;
- a sharp cutting blade extending upwardly from said finger at said trailing portion and facing toward said distal end; and
- an elongated hood joined to and carrying said finger in a junction therewith at said trailing portion and extending forwardly therefrom generally above and parallel to said finger
- the side surfaces of said junction forming a continuation of the side surfaces of said finger and flaring outward to an increased width rearward of said blade;
- depending sides on said hood extending downward to embrace said finger and to restrict access to said blade;
- the leading edges of said depending sides occuring adjacent the distal end of said finger while leaving same visually exposed, and the trailing edges of said depending sides occurring forward of the flared sides of said finger and hood junction leaving a space between said trailing edges and said flared sides for withdrawal of a severed envelope therebetween.

4,081,908
DENTAL IMPLANTS

Meer Sneer, 24 Merkas Baale Melacha St., Tel-Aviv, Israel

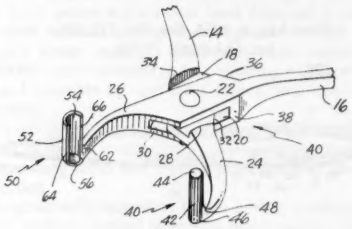
Filed Jul. 8, 1976, Ser. No. 703,379
Int. Cl.² A61C *13/00*
U.S. Cl. 32—10 A 6 Claims

1. A dental implant comprising in combination a foundation member of V-shaped cross section, comprising two members connected at the apex of the V;
- said two members comprising plates of substantially rectangular shape, of about 10 mm. height and about 20–35 mm. width, forming an angle of 10° to 30° with each other;

the foundation member having crown-support connecting means provided with cup-shaped shock-absorbing means,

said foundation member being adapted to be inserted in to the jaw.

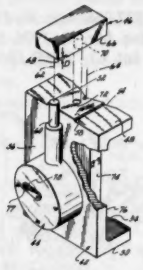
4,081,909
ORTHODONTIC PLIERS
Francisco G. García, Box A B, Rio Piedras, P.R. 00928
Filed Jul. 30, 1976, Ser. No. 710,125
Int. Cl.² A61C *13/22*
U.S. Cl. 32—66 **6 Claims**



1. An orthodontic pliers, which comprises:
first and second jaw members pivotally coupled to each other and having handle means extending laterally from one end thereof and wire bending means extending transversely from the other end thereof;
said wire bending means including a first elongated bending member having an arcuate outer surface and connected to said other end of said first jaw member at a first junction point, and a second elongated bending member connected to said other end of said second jaw member at a second junction point and comprising a semi-tubular body having an arcuate inner surface complementary to and adapted to mate with said arcuate outer surface of said first elongated bending member;
the major portion of said first and second elongated bending members extending substantially beyond their respective junction points with said first and second jaw members for permitting intra-oral bending of orthodontic arch wires therebetween.

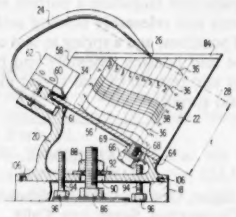
4,081,910
SHUT HEIGHT GAUGE AND METHOD OF USING SAME
H. Jack Hammond, 8004 Acme Way, Louisville, Ky. 40219
Filed May 19, 1976, Ser. No. 687,988
Int. Cl.² G01B *3/30*
U.S. Cl. 33—181 R **11 Claims**

1. A shut height gauge comprising, in combination,
a body having at least one apparatus engaging surface and a surface perpendicular thereto,
an indicator mounted on said body and including a plunger substantially parallel to said apparatus engaging surface and extending beyond the plane of said perpendicular surface, and
a set bar for mastering said indicator receivable on said perpendicular surface, said set bar having first and second surfaces substantially parallel to said perpendicular surface, said second surface being offset a predetermined distance from said first surface, said first surface contacting said perpendicular surface and said plunger contacting



said second surface when said set bar is received on said perpendicuar surface.

4,081,911
SUNDIAL
Albert M. Eldridge, 4711 Chaperro Trail, Austin, Tex. 78731
Continuation-in-part of Ser. No. 577,176, May 14, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,008
Int. Cl.² G01C *17/34, 21/02;* G04B *49/02*
U.S. Cl. 33—270 **5 Claims**



1. A sundial comprising:
a body portion having a concave inward, cylindrical wall of fixed radius *r*, the sundial being oriented during operation so that the longitudinal axis of said cylindrical wall and the polar axis of the earth together define a plane extending essentially north and south through the earth;
a pair of thin sheets formed of resiliently flexible material, said sheets being alternately mountable in the same location on said cylindrical wall so as to be bendable from a planar configuration and assume a cylindrical configuration and present an outwardly facing cylindrical surface;
said resiliently flexible sheets, when removed from said cylindrical wall, reassuming a planar configuration;
fastening means which can be loosened to enable the mounted sheet to be rotated about said longitudinal axis, and which can be tightened to secure the mounted sheet against rotation;
said fastening means being releasable to permit substitution of said sheets;
a gnomon connected to said body portion, said gnomon comprising a shaft having a relatively heavy portion narrowing to a fine tip, the tip thereof coinciding with the longitudinal axis of said cylindrical surface and casting a shadow on said cylindrical surface dependent upon the hour angle and declination of the sun;
a plurality of generally parallel, equally spaced time lines disposed on said cylindrical surface and extending in a direction essentially longitudinally of the longitudinal axis thereof, wherein:

said time lines are longitudinally bounded by lines extending circumferentially around said cylindrical surface and spaced apart a distance d_1 defined approximately by the equation

$$d_1 = 2r \sin 23.5°,$$

said time lines vary from time lines strictly parallel to the longitudinal axis of said cylindrical surface by a distance d_2 defined approximately by the equation

$$d_2 = r \pi \alpha / 180°$$

said time lines strictly parallel to the longitudinal axis being derivable by the plotting on said cylindrical surface, for given local hour angles, the point of intersection with said surface of a line extending from said tip of said gnomon and inclined to the horizontal and rotated about the vertical to angles defined by the altitude and bearing of the sun for varying declinations thereof, and

α being the algebraic difference between the GHA of the sun and the GHA of noon LCT, so that a positive value for α when the sun is at a particular declination indicates that the GHA of the sun precedes noon LCT and requires that said time lines curve to the east of said times lines strictly parallel to the longitudinal axis of said cylindrical surface and a

negative value for α when the sun is at a particular declination indicates that the GHA of the sun follows noon LCT and requires that said time lines curve to the west of said time lines strictly parallel to the longitudinal axis of said cylindrical surface; said time lines comprising:

a plurality of principal time lines spaced apart about the circumference of said cylindrical surface a distance d_4 defined approximately by the formula

$$d_4 = r \pi (15°)/180°$$

said principal time lines being designated hour lines to represent hours of the day and being marked at one longitudinal extreme in hours of standard time and at the opposite extreme in hours of daylight saving time; and

a plurality of secondary time lines parallel to said hour lines and intercalated therebetween to define minutes of time between said hour lines;

the time lines disposed on one of said sheets being configured to designate time occurring from the winter solstice to the summer solstice, and the time lines disposed on the other sheet being configured to designate time occurring from the summer solstice to the winter solstice;

a plurality of parallel, spaced apart date lines disposed on said cylindrical surface and extending at least partially about the circumference thereof, the distance between said date lines defining ranges of declination of the sun and the locations thereof along said time lines defining the month of the year and the approximate date thereof as the shadow of said tip of said gnomon is cast thereupon or therebetween;

said cylindrical wall being horizontally truncated by a horizontal plane passing therethrough in a manner essentially tangential to the surface of the earth at a point of observation;

said date lines being circumferentially projectable about said cylindrical surface to ultimately intersect the edge of said truncation of said cylindrical surface, the concurrent intersection of one of said time lines with one of said date lines at said edge of said truncation indicating approximately the time of sunrise at the western truncation and the time of sunset at the eastern truncation;

a plurality of lines of declination disposed on said cylindrical surface parallel to a line of zero declination and extending on either side thereof seriatim to the terminal points of said time lines to define the value of the declination of the sun as the shadow of said tip of said gnomon is cast thereupon or therebetween;

a plane perpendicular to the longitudinal axis of said cylindrical surface and including said tip of said gnomon intersects said cylindrical surface to define said line of zero declination of the sun thereon; said time lines being collectively rotatable by moving said sheet about said longitudinal axis a distance d_3 defined approximately by the formula

$$d_3 = r \pi \theta / 180°$$

wherein θ is the difference between the longitude of the standard meridian of the zone of time in which the sun is being observed and the longitude of the meridian of the point of observation of the sun; so as to correct for differences between LCT and the time of the standard meridian of the zone of time in which the sun is being observed;

a scale calibrated in degrees; and

an indicator;

one of said scale and indicator being rotatable with said time lines about said longitudinal axis and including indicia intersecting the noon time line of standard time at a point at which α is of zero magnitude;

the other of said scale and indicator being immovable relative to said time lines and including indicia directed along a line parallel to the longitudinal axis of said cylindrical surface through the locus of points defining the vertically lowest points of successive circumferential lines extending about said cylindrical surface;

said indicator being aligned with said scale so that said scale and indicator provide a measurement of the rotation of said time lines about said longitudinal axis.

4,081,912

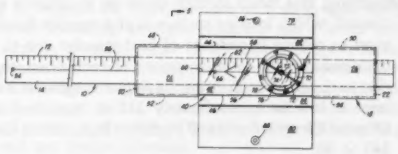
MAGNETIC BEARING PLOTTING AND SIGHTING DEVICE

David F. Laney, 724 Hoover St., Norman, Okla. 73069

Filed Jun. 24, 1977, Ser. No. 809,537

Int. Cl.[2] G01C *17/12*

U.S. Cl. 33—272 **11 Claims**



1. A device for taking and plotting magnetic bearings comprising:

a flat, elongated straight edge element of right parallelepiped configuration having an elongated straight edge along one side thereof, and graduated indicia along said straight edge, said straight edge having an aperture therein for frictionally and removably receiving a sight pin extending vertically upwardly from the major plane of the straight edge element;

a housing including a pair of spaced, opposed hollow portions each closed at one end by an end wall and interconnected by a bottom wall supporting said straight edge element, said end walls each having slots therein with said straight edge element extending through said slots;

a magnetic compass subassembly mounted on said straight edge between said hollow portions of said housing and including:

a transparent plate having indicia thereon facilitating alignment of two spaced points on said plate with said aperture in said straight edge element;

a sight pin removably retained at one of said points and

projecting from said transparent plate and normal to the major plane of said straight edge element; and

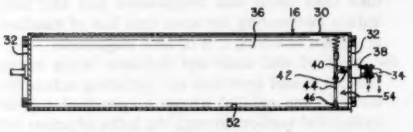
a magnetic compass secured to said transparent plate and including a pivotally mounted compass needle supported for pivotation about an axis extending through the second point on said plate and normal to the major plane of said straight edge.

4,081,913

PULP AND PAPER DRYING APPARATUS AND METHOD

Reijo K. Salminen, 1842 Academy Rd., Bellingham, Wash. 98225

Filed Jul. 26, 1976, Ser. No. 708,724
Int. Cl.[2] F28F *13/18*
U.S. Cl. 34—41 **10 Claims**



1. In a method of drying a sheet of material, such as wood pulp or paper, wherein the method comprises:

a. directing said sheet along a path of travel through one or more rotatably mounted drying drums, with the sheet traveling in a circuitous path around a substantial portion of the circumference of each drum so as to be in heat exchange relationship therewith, and

b. directing pressurized steam into the interior of each drum and removing from each drum interior steam condensate that forms therein,

an improvement to increase the effectiveness of heat transfer to the sheet being dried, said method comprising:

condensing said steam in each drum on an interior surface thereof, which interior surface is of a smooth finish sufficient to reduce impedence of heat transfer due to water condensate at the interior surface of each drum, the interior surfaces of each drum having a roughness index at least at low as approximately 125 as measured on the General Electric Surface Roughness Index Scale Cat. No. 342 × 60.

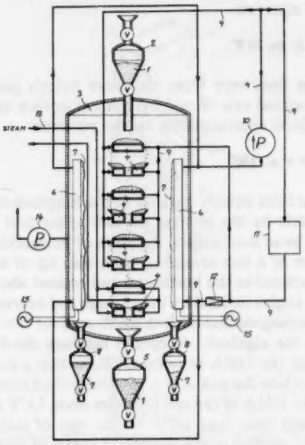
4,081,914

FREEZE DRYER

Robert Rautenbach, Turmstr. 46; Horst Hoeck, Kaiser-Friedrich-Allee 2a, and Wolfgang Beer, Beeckstr. 38, all of Aachen, Germany (5100)

Filed Aug. 25, 1976, Ser. No. 717,556
Claims priority, application Germany, Aug. 26, 1975, 2537850
Int. Cl.[2] F26B *13/30*
U.S. Cl. 34—92 **6 Claims**

1. A freeze drier comprising housing means forming a sublimation chamber; at least one heating plate in said sublimation chamber for heating a material to be freeze-dried therein; at least one ice condenser in said sublimation chamber; means for evacuating said sublimation chamber; and a hat pump for recovering heat from said ice condenser and recirculating same to said heating place, said ice condenser being provided with means for releasing deposited ice therefrom, the means for releasing ice from said ice condenser comprising a heating



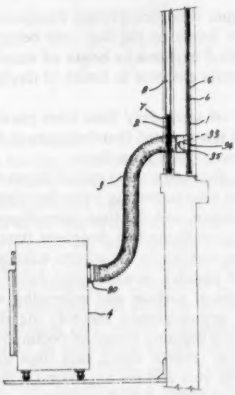
layer carried by said ice condenser and briefly heatable to release the ice therefrom.

4,081,915

EXHAUST SYSTEM FOR LAUNDRY DRYER

Gizela Materniak née Babcerowicz, and Zdzislaw Materniak, both of 7211 Fielding Avenue, Apt. 102, Montreal, Canada

Filed Jun. 4, 1976, Ser. No. 692,686
Int. Cl.[2] F24F *13/18*
U.S. Cl. 34—235 **5 Claims**



1. An air exhaust system for a laundry dryer located in a room having a window including a window frame and a window sash slidable therein, and having an air exhaust outlet, comprising a window insert plate assembly removably inserted within said window frame and with said window sash contacting an edge of said window insert plate assembly, said window insert plate assembly including telescopically-engaged rectangular plate sections to fit window frames of different widths, one of said plate sections having an aperture, a unitary box-like closure means movably mounted within said aperture for movement between an aperture closing position and an aperture opening position, said box-like closure means including an outside plate, a side wall having a venting opening adjacent said outside plate and a nipple connected to said side wall and remote from said outside plate inwardly of the latter and com-

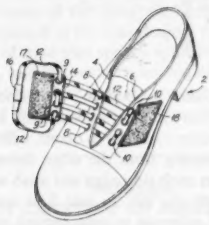
municating with the interior of said box-like closure means, said side wall and its venting opening being disposed inwardly of said one plate section and said outside plate closing said aperture and flush with said one plate section in the aperture closing position of said box-like closure means, said side wall and outside plate protruding outwardly from said one plate section in the aperture opening position of said box-like closure means with said venting opening being located completely outside of said one plate section, and further including a flexible venting hose having detachable connecting means at both ends for detachably connecting one end of said hose to said nipple and the other end of said hose to the exhaust outlet of said laundry dryer, said box-like closure means preventing air circulation between said room and the outside, in both positions of said box-like closure means when said hose is connected to said nipple and to said laundry dryer.

4,081,916

QUICK LACE TIGHTENER FOR SHOES

Thomas Salisbury, Box 80033, College, Ak. 99701

Filed Feb. 3, 1977, Ser. No. 765,303
Int. Cl.[2] A43B *11/00*
U.S. Cl. 36—50 **2 Claims**



1. A quick lace tightener for shoes, a shoe having adjacent closure flaps, each provided with a plurality of eyelets, comprising:

a shoe lace member laced through and extending from the eyelets of one flap and outwardly through the eyelets of the other flap;

a first patch of fastener fabric secured to the outer ends of said shoe lace members; and

a second path of complementary fastener fabric secured to the outer surface of said shoe adjacent to said one flap whereby said first patch may be pulled toward said second patch to tighten said lace and draw said flaps together and then engaged with said second patch to hold said lace in tensioned condition, said lace being threaded through eyelets in a leather patch having said first patch of said material secured thereon.

4,081,917

TECHNIQUE AND ARTICLES FOR FORMING SHOE SHANKS

Robert W. Bradley, Marblehead; Donald L. Bray, Beverly, and Raymond L. Peterson, Beverly Farms, all of Mass., assignors to Bush Universal, Inc., Woburn, Mass.

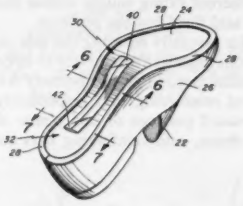
Filed Apr. 29, 1976, Ser. No. 681,562
Int. Cl.[2] A43B *13/42;* A43D *0/00*
U.S. Cl. 36—76 R **25 Claims**

1. An article for use as a shoe reinforcement comprising:

an elongated sleeve surrounding a matrix which includes an externally activatable thermosetting resin and a multiplicity of reinforcing fibers embedded in the matrix,

said sleeve being substantially impermeable to said matrix,

said sleeve, matrix and reinforcing fibers being flexible and deformable, as a unit, to enable said article to be applied to a selected surface of a shoe and to substantially conform to



the shape of said surface while in an unactivated condition.

4,081,918

GOLF TRAINING DEVICE

John P. O'Brien, 175 E. Delaware Pl., Chicago, Ill. 60611

Filed Oct. 26, 1976, Ser. No. 735,761
Int. Cl.[2] A63B *69/36;* A43C *15/00*
U.S. Cl. 36—132 **5 Claims**

1. A wedge-shaped golf training device adapted to be removably affixed to a shoe, said training device comprising a wedge-shaped body having a lower, ground engaging surface, and an upper support surface, said upper support surface adapted to support the lower surface of a shoe, said wedge-shaped body including an upper extension and a lower extension extending at right angles to said upper support surface, said upper extension including plunger means adapted to move parallel to said upper support surface, and means to adjustably urge said plunger means toward said lower extension and frictionally engage the sole of a shoe between said plunger means and said lower extension.

4,081,919

BACKHOE BUCKET

Ted L. Teach, Dayton, Ohio, assignor to Laserplane Corporation, Dayton, Ohio

Filed Mar. 30, 1977, Ser. No. 782,926
Int. Cl.[2] E02F *5/02*
U.S. Cl. 37—103 **2 Claims**

1. A digging bucket for a backhoe or similar machine for producing a smooth-bottomed excavation, comprising, in combination:

(1) a "U"-shaped primary frame having planar sidewalls rigidly interconnected by two spaced, fixed bottom portions;

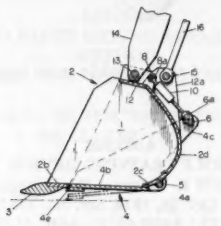
(2) the first of said fixed bottom portions comprising a transverse bar extending across the forward portions of the bucket and rigidly mounting a plurality of forwardly projecting, laterally spaced digging teeth;

(3) the other of said fixed bottom portions comprising an upwardly curved sheet, rearwardly spaced from said transverse bar and extending upwardly to define at least a portion of the back wall of the digging bucket;

(4) a movable bottom member of generally "U"-shaped configuration, constructed and arranged to snugly surround said primary frame and having a platelike bottom portion thereof fitting snugly within the space provided between said fixed bottom portions;

(5) means for pivotally securing the side walls of said movable bottom member respectively to opposite sides of said other bottom portion of said primary frame;

(6) a pair of reinforcing bars respectively secured to the outer forward portions of said planar side walls of said primary frame, said reinforcing bars being of a greater



thickness than said side walls of said movable bottom member, thereby protecting said side walls of said movable bottom member from primary engagement with any soil being dug, and

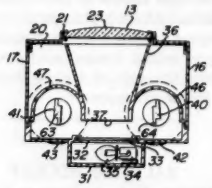
(7) power means for pivoting said movable bottom member relative to said primary frame to displace the forward edge of said platelike bottom portion a limited distance downwardly relative to said digging teeth, whereby said forward edge may selectively become the effective digging edge of the bucket to produce a smooth bottomed excavation.

4,081,920

FILM VIEWER

Raymond J. Magee, 335 Independence Dr., Forked River, N.J. 08731

Filed Oct. 19, 1976, Ser. No. 733,790
Int. Cl.² G03B *1/10*
U.S. Cl. 40—362 **1 Claim**



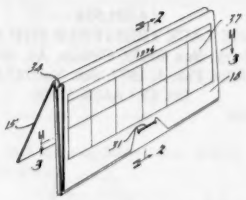
1. A film viewer comprising a housing front wall, a peripheral housing side wall extending about and rearwardly from said front wall, a housing rear wall swingably connected to and extending in closing relation with the rear of said side wall, a front viewing window in said housing front wall, a rear lamp in said housing carried by said rear wall and visually accessible through said viewing window, a generally flat film holder located in position between said window and lamp for illuminated presentation through said window, and rotary spools carried by said holder on opposite sides thereof for rotatably supporting coiled end portions of film extending through said holder, said holder and spools combining to define a film carrying cartridge removable and replaceable upon opening of said rear housing wall, whereby said spools are selectively wound and unwound for viewing a selected film portion, a pair of rotatable finger-actuable wheels mounted in said housing walls, and direct axial drive means on each of said wheels for direct axial interfitting engagement with respective spools and rotatable therewith, said wheels being at least partially exposed exteriorly of said housing walls for finger rotation to shift film in opposite directions in said holder, lens means on said window to facilitate viewing, said window and lens means being larger than said film holder, and a convergent light passageway extending between said lens means and holder, and internal guide walls within said housing side wall conformably engaging said cartridge to locate said spools in said direct axial interfitting engagement with said wheels.

4,081,921

ADVERTISING FOLDER

Norman J. Humphrey, 17123 Sprenger, E. Detroit, Mich. 48021

Filed Dec. 30, 1976, Ser. No. 755,673
Int. Cl.² G09F *3/04*
U.S. Cl. 40—120 **7 Claims**



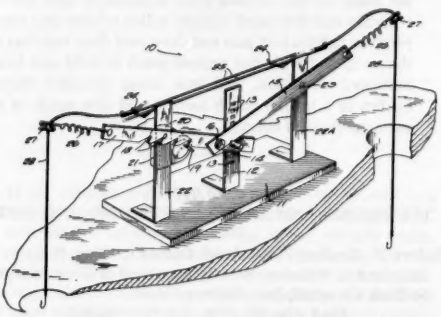
1. An advertising folder embodying a cardboard sheet of rectangular form divided into four substantially equal sections by three score lines where folds are to occur, a first section has a tab extending outwardly from the edge thereof, a second section having a flap at each side edge and a tab with a slot cut therefrom aligned with the tab on said first section, a third section having a slot adjacent to said second section, and a fourth section divided by two adjacent score lines both of which are folded to form a tray when secured adjacent to said second section.

4,081,922

DOUBLE FISH POLE JIGGER

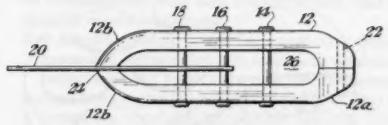
Elias J. Johnson, 503 Stevens St., Green Bay, Wis. 54303

Filed Oct. 26, 1976, Ser. No. 735,529
Int. Cl.² A01K *97/10*
U.S. Cl. 43—19.2 **2 Claims**



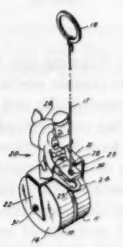
1. A dual fish line jigger including a base, a pair of vertical standards each fixed adjacent to an end of said base, an electric motor fixed to one of the standards, an electric battery attached thereto, a rotary cam driven by said motor to cause upward movement of a pair of pivoted arms mutually joined by pivot and peg means.

4,081,923
FISH HOOK HOLDER
T. John Pruncutz, 6550 SW. 52nd Ter., Miami, Fla. 33155
Filed Aug. 30, 1976, Ser. No. 718,554
Int. Cl.[2] A01K 97/06
U.S. Cl. 43—57.5 R 3 Claims



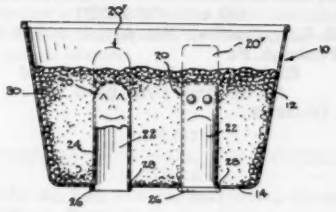
1. An improved fish hook holder for retaining a fish hook while protecting the manual threading and affixing of a line or leader to a hook comprising:
an elongated resilient body, said body having a hollow interior chamber, said body including a pair of resilient separable bifurcated arms forming a slotted surface at one end of said body, said surface slot being smaller than the diameter of a fish hook body and forming a closed surface at the opposite end of said body;
said bifurcated body arms form a slot with a pair of parallel, planar wall surfaces having a longitudinal length equal to the thickness of the bifurcated arms, said wall surfaces being disposed in the longitudinal axis of said body; and
a plurality of rigid pins spaced apart longitudinally, laterally coupling said bifurcated arms together whereby said pins may accommodate and are spaced at different distances from said slotted end to accommodate fish hooks of varying lengths.

4,081,924
YO-YO TOY CARRYING AN ADDITIONAL MEMBER
Norman Fabricant, 94-19 64th Rd., Rego Park, N.Y. 11374
Filed Nov. 19, 1976, Ser. No. 743,261
Int. Cl.[2] A63H 1/30
U.S. Cl. 46—61 8 Claims



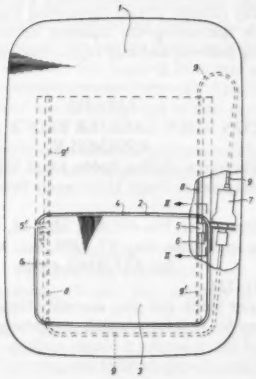
1. A yo-yo toy comprising:
a. two circular blocks arranged in parallel planes, said blocks being spaced apart and having inner faces facing each other and outer faces facing in opposite directions,
b. a pin joining the inner faces of said blocks at their centers,
c. a string extending into the space between said blocks and having one end secured to said pin,
d. additional means carried by said blocks, said additional means having a portion rotatably mounted on the outer face of each of said blocks,
e. a hole in a portion of said additional means which is spaced from said blocks, said string extending through said hole, so that when said blocks are suspended from said string said additional means is maintained above the level of the axis of said pin, and
f. a guide forming part of said additional means, said guide having an opening through which said string extends, and said guide being between said portion having said hole and said blocks and being spaced from both said portion and said blocks.

4,081,925
FINGER PUPPETS
Merrill K. Apple, 863 Linden La., Davis, Calif. 95616
Filed Aug. 30, 1976, Ser. No. 718,687
Int. Cl.[2] A63H 3/14
U.S. Cl. 46—116 8 Claims



1. In combination:
a container;
at least one finger hole formed in a wall of said container;
at least one elastic finger puppet, equal in number to said holes, positioned through said finger holes and within the interior of said container;
means for sealing said finger puppets to the periphery of said holes; and
particles within said container sufficient to cover said puppets when said puppets are in their unstretched condition.

4,081,926
SUNROOF
Hans Jardin, Inning, Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Germany
Filed Apr. 1, 1977, Ser. No. 783,647
Claims priority, application Germany, Apr. 29, 1976, 2618788
Int. Cl.[2] E05F 11/38
U.S. Cl. 49—210 10 Claims



1. Sunroof or the like apparatus of the type having an opening surrounded by frame structure, said apparatus comprising:
a rigid cover member,
first and second guide elements disposed at respective opposite lateral sides of said cover member, said guide elements being configured to guidably support said cover member at said frame structure during movement of said cover member from a position closing said opening to respective open positions.
incompressible cable means having a first end connected and

movable with said first guide element and a second opposite end connected to and movable with said second guide element,

and drive means for drivingly moving said cable means,

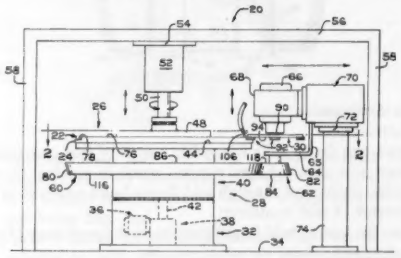
wherein said cable means is disposed so that when said drive means is actuated, said cable means pulls said first guide element in a direction and pushes said second guide element in the same direction.

4,081,927

APPARATUS FOR GRINDING A RABBET IN AN EDGE OF A GLASS SHEET

Joseph B. Kelly, Crestline, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 29, 1976, Ser. No. 745,705
Int. Cl.² B24B *17/02*; B24D *7/10*
U.S. Cl. 51—101 R **4 Claims**



1. An apparatus for grinding a recess in marginal edge portions of a glass sheet, comprising:

means for supporting the sheet;

a flat disc;

a circular band of grinding material on a surface of said disc;

shaft means mounting said disc such that the axial center of said shaft means and plane of said disc subtend an oblique angle;

means acting on said shaft means for rotating said disc through a circular oscillatory path to move said band of grinding material toward, through and away from a plane generally parallel to said supporting means; and

means for decreasing the distance between said band of grinding material and said supporting means as said disc is rotated.

4,081,928

SILICON SLICE CARRIER BLOCK AND PLUG ASSEMBLY

Gerald P. Kinnebrew, Dallas; Bobby Mack Watkins, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 470,431, May 16, 1974, abandoned. This application Aug. 17, 1976, Ser. No. 715,341
Int. Cl.² B24B *4/04*
U.S. Cl. 51—131 **12 Claims**

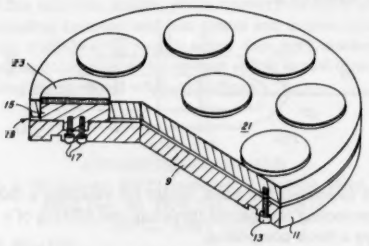
1. A carrier block and plug assembly for retaining semiconductor slices for polishing which comprises:

(a) a rigid block having a planar surface,

(b) a retainer having parallel opposite surfaces and a plurality of apertures extending therethrough, said apertures having the same diameter throughout,

(c) a spacer positioned between said block and retainer in the non-apertured region,

(d) a plurality of plugs secured to said block and extending into said apertures, said plugs having substantially the same diameter as said apertures and substantially the same thickness as said retainer, thereby defining pockets having a uniform depth equal to the thickness of said spacer, said plugs each comprising means for supporting a wet semiconductor slice for free rotation thereon and consisting essentially of a rigid plastic material which is nonabsorptive and retains its shape at elevated temperatures, each plug having only a single surface exposed within its corresponding aperture, said plug surface being planar and having a high lubricity,



(e) means securing said block to said retainer,

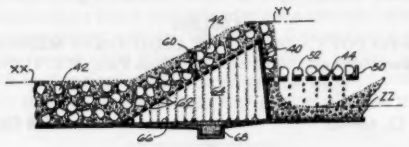
(f) the exposed surfaces of said block, retainer and plugs being mutually parallel.

4,081,929

VIBRATORY MILL WITH DRAINAGE AND CLASSIFYING MEANS

George F. Jones, Mishawaka, and Raymond M. Leliaert, South Bend, both of Ind., assignors to Wheelabrator-Frye, Inc., Hampton, N.H.

Filed Dec. 9, 1976, Ser. No. 748,780
Int. Cl.² B24B *31/00*
U.S. Cl. 51—163.2 **5 Claims**



1. The combination of a finishing mill having a substantially annular trough adapted to contain media and parts, means for vibrating the trough to cause media and parts to travel about the trough, a dam extending crosswise of the trough whereby the parts and media rise to a level above normal level in advance of clearance of the dam, the improvement in which the approach to the dam is inclined from the bottom wall of the trough to the apex of the dam, and means to remove fluids, dust, dirt and undersized particles of media comprising passages through the approach dimensioned to be less than the dimension of the parts and media whereby parts and media continue to travel over the approach while the said material fluids, dust, dirt and undersized particles of drains through the openings in the approach, a separate compartment communicating with the underside of the approach to receive the material draining therethrough, and means for removing the said material from the compartment.

4,081,930

ARRANGEMENT FOR CLEANING A CONDUIT

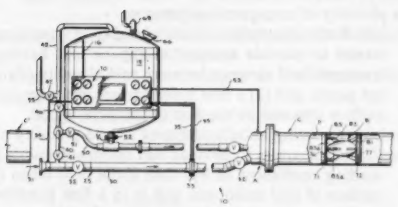
Garnett E. Jones, Baytown, Tex., assignor to Intra-Pipe, Inc., Houston, Tex.

Filed Dec. 15, 1975, Ser. No. 641,100
Int. Cl.² B24C *3/16*, *1/00*
U.S. Cl. 51—411 **2 Claims**

1. An arrangement for cleaning conduit such as a pipeline or the like including:

a. storage means for receiving particulate material;

b. conduit means for connecting with the pipeline to be cleaned, said conduit means including:
1. first conduit means for receiving a pressurized gas stream and connected with the pipeline to be cleaned;
2. second conduit means connected to said first conduit means and with said storage means for diverting part of the pressurized gas stream from said first conduit means to communicate with said storage means, said second conduit means including:
first branch conduit means for conducting pressurized gas to said storage means to maintain a predetermined pressure on the particulate material therein; and
second branch conduit means connected to said storage means for receiving particulate material from said storage means and commingling it with the pressurized gas in said second branch conduit means, said second branch conduit means being connected to the pipeline to be cleaned whereby the particulate matter and pressurized gas may be conveyed to the pipeline to be cleaned for cleaning thereof;
c. valve means in each said first and second conduit means and in each said first and second branch conduit means for controlling the flow of pressurized gas therethrough;
d. bleed-off conduit means with valve means therein and connected to said first branch conduit means for selectively reducing the pressure in said storage means to atmosphere;
e. means to measure the amount of pressurized gas conducted through said first conduit means to the pipeline to be cleaned;



f. movable barrier means movable in the pipeline by the pressurized gas from said first conduit means and said second branch conduit means, said barrier means including:
1. spaced annular seal means for engaging the interior of the pipeline to be cleaned;
2. support means for said annular seal means including annular members secured to each of said seal means, each of said annular members having an opening for receiving and discharging the pressurized gas therethrough;
3. surface means extending longitudinally between said support means and positioned adjacent the opening in one of said annular members which receives the pressurized gas for directing the gas to impinge on the pipeline to be cleaned; and
4. means adjustably connecting said surface means between said support means of said spaced annular seal means whereby said surface means may be selectively positioned relative to the opening in said one annular member which receives the pressurized gas to adjustably control the angle of impingement of gas against the pipeline to be cleaned and to adjustably control the rate of movement of said movable barrier means through the pipeline to be cleaned.

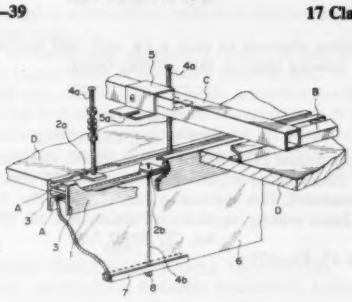
2. A method of performing internal cleaning of pipeline comprising the steps of:
a. positioning a movable barrier in a pipeline;
b. flowing gas under a desired pressure into the pipeline at a predetermined location;
c. flowing a mixture of gas and an abrasive substance into the pipeline at the predetermined location whereby the gas and abrasive substance flow through the movable barrier to propel it through the pipeline while the barrier deflects the gas and abrasive substance against the interior of the pipe line for cleaning thereof;
d. controlling the rate of flow of gas and abrasive through the movable barrier to control the rate of movement thereof;
e. providing an opening in the pipeline for retrieval of the movable barrier and discharge of the gas and abrasive mixture; and
f. maintaining the gas and abrasive mixture under pressure in the pipeline to propel the barrier at the controlled rate of travel through the pipeline for cleaning thereof by the sand and gas mixture.

4,081,931

ANTI-SMOKE HANGING WALL AND CONSTRUCTION METHOD

Kiyotaka Miyoshi, 2-38, 2-Chome, Kamiya-cho,, Hiroshima-shi, Hiroshima-ken, Japan

Filed Apr. 20, 1976, Ser. No. 678,657
Claims priority, application Japan, Apr. 23, 1975, 50-5865[U]
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—39 **17 Claims**



1. Anti-smoke hanging wall comprising:
a channel bar with a downward-opening slot, said bar being exposedly attached to the ceiling member of a building:
a plurality of hanging bolts having upper ends connected to said channel bar, said bolts hanging from said channel bar and having lowertips remote from said channel bar;
a wall bearer fixed to said lower tips of said hanging bolts; and
a hanging wall positioned between said channel bar slot and said wall bearer, the wall bearer supporting the wall.

4,081,932

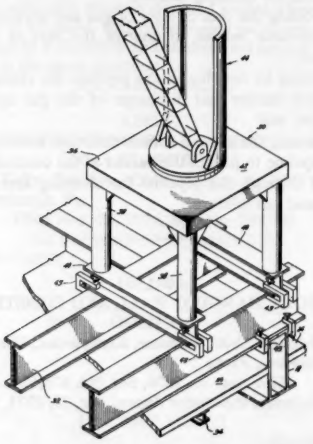
PLATFORM CRANE

James Eubank Armstrong, Crosby, Tex., assignor to Pool Company, Dallas, Tex.

Continuation of Ser. No. 603,734, Aug. 11, 1975, abandoned, which is a continuation of Ser. No. 488,276, Jul. 15, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 698,119
Int. Cl.[2] E02B *17/00*
U.S. Cl. 52—111 **7 Claims**

1. A method for constructing a rig on an offshore platform having a pair of substantially parallel horizontal capping beams and a deck-mounted crane comprising
lifting a pair of base beams with said deck-mounted crane and placing them to span said capping beams,
removably attaching said base beams to said capping beams,
lifting a pedestal of a second crane with said deck-mounted crane and placing it on said base beams,
removably attaching said crane pedestal to said base beams,

lifting a second crane rotating upper works with said deck-mounted crane and placing said works on the pedestal, fastening said works to said pedestal, and



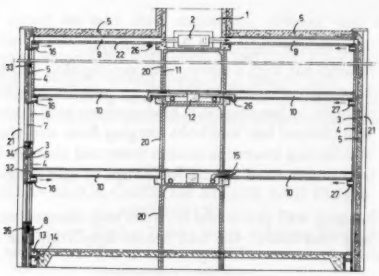
lifting elements of such a rig with said second crane and placing them on said capping beams.

4,081,933

OUTER WALL ELEMENT

Pekka Juhani Lilja, Siilitie 5 B 10, 00800, Helsinki 80, Finland

Continuation-in-part of Ser. No. 585,159, Jun. 9, 1975, abandoned. This application Jun. 17, 1976, Ser. No. 696,986
Claims priority, application Finland, Jun. 19, 1974, 1880/74
Int. Cl.[2] E06B *7/12*
U.S. Cl. 52—171 **8 Claims**



1. An outer wall element for use in a building employing a central unit for air conditioning, with at least one window having at least two panes and with a height the same as the height of the building, comprising

a concrete part and a heat insulating part,

a continuous air channel running through the element from end to end and of a width substantially corresponding to the width of the element, the space between the window panes forming a part of the air channel,

the inlet of said air channel being connected to a feed channel for cooling air or heating air, respectively, from the central unit and the outlet of said air channel being connected to a channel leading to the central unit for reuse of energy stored in the circulation air,

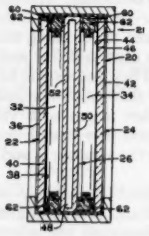
and there being partition walls interconnecting the windows, the windows and the partitions walls dividing said air channel into a part for incoming fresh air and a part for outgoing air, the inlet for the fresh air and the outlet for the outgoing air being arranged at the same end of the wall element, and the fresh air part of the air channel and the outgoing air part of the air channel being in connection with each other at that end of the wall element which is opposite to the end having the inlet and the outlet and through the windows, the windows thus forming a part of the air channel.

4,081,934

SEASONABLY ADJUSTABLE WINDOW

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 720,184, Sep. 3, 1976, abandoned. This application Apr. 27, 1977, Ser. No. 791,350
Int. Cl.[2] E06B *3/24*
U.S. Cl. 52—171 **25 Claims**



18. A seasonably adjustable window, comprising:

a plurality of transparent substrates;

means for sealing edges of said plurality of transparent substrates to provide a sealed multipane unit having (1) at least one dead airspace between said plurality of transparent panes; and (2) a first outer surface and a second outer surface opposite to the first outer surface; and

selective coating on selected ones of said plurality of transparent substrates to provide said multipane unit (1) with a shading coefficient of less than about 0.20 when the first surface of said multipane unit is in a first predetermined position and the second surface of said multipane unit is in a second predetermined position and (2) with a shading coefficient of greater than about 0.25 when the second surface of said multipane unit is in the first predetermined position and the first surface of the said multipane unit is in the second predetermined position.

4,081,935

BUILDING STRUCTURE UTILIZING PRECAST CONCRETE ELEMENTS

Harry Honon Wise, Belle Meade, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 708,504, Jul. 26, 1976, abandoned. This application May 5, 1977, Ser. No. 793,972
Int. Cl.[2] E04B *5/16*
U.S. Cl. 52—236.8 **18 Claims**

1. A building floor structure comprising:

(a) a supporting first precast concrete column having protruding from the upper end thereof at least one rod;

(b) at least one horizontal beam and deck member supported on said first column;

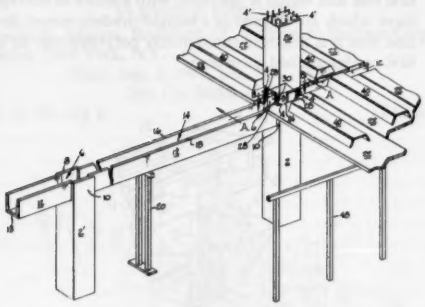
(c) a second precast concrete column disposed above said first column and having extending downwardly therefrom at least one rod;

(d) said first and second columns being spaced apart by a distance substantially equal to the desired depth of the finished floor and said beam and deck member;

(e) said rods extending from said first and second columns respectively being disposed in adjacent pairs, each pair comprising one rod from each column;

(f) said second column being held in said spaced apart position prior to pouring and setting of a topping concrete

layer by coupling means fixedly securing together the rods of each of said pairs; and



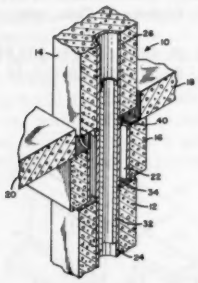
(g) a subsequently applied topping layer of concrete which fills the space between said columns, covers said beam and deck member, and secures these components into a unitary monolithic structure.

4,081,936

STRUCTURAL FRAMEWORK WITH IMPROVED CONNECTOR

Mark J. Wise, Brookville, Ohio, assignor to The Flexicore Co., Inc., Dayton, Ohio

Filed Nov. 24, 1976, Ser. No. 744,690
Int. Cl.[2] E04H *12/00*
U.S. Cl. 52—301 **6 Claims**



1. In a structural framework including a lower column having a hollow core, an upper column having a hollow core and superimposed above said lower column and an intersecting beam having a vertically extending opening therethrough intermediate said upper and lower columns, a unitized, load-transmitting connector comprising:

a spindle extending through said beam opening and received within said hollow cores of said columns,

said spindle being in substantially non-vertical load bearing relationship to said upper column,

an integral sleeve surrounding said spindle and at least partially received in said beam opening,

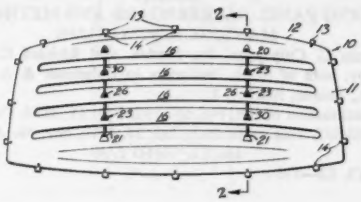
said sleeve being in load bearing relationship to said upper column, transferring said weight of said upper column to said lower column by bearing contact therewith, and

means fixing said sleeve to said spindle with insufficient strength to carry said weight of said upper column.

4,081,937

VEHICLE SUN-SHADE

Kevin Errol Koch, 14 Kinkaid Avenue, North Plympton, Australia (5037)

Filed Sep. 28, 1976, Ser. No. 727,334
Claims priority, application Australia, Sep. 29, 1975, 3351/75
Int. Cl.[2] E06B *7/08;* E04B *5/52*
U.S. Cl. 52—309.1 **5 Claims**

1. A vehicle sun-shade of the louvre type which is attachable over the rear vision window of a motor vehicle, comprising:

a sheet of polymeric material having a surround, attachment means extending outwardly of the surround, and a plurality of louvres inclined to the general plane of the surround;

a series of aligned apertures in respective said louvres between their ends;

a plurality of bushes each engaging a respective said aperture, said bushes being of polymeric material; and

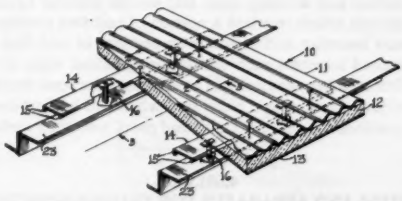
a spacer rod also comprising polymeric material extending through said bushes and frictionally engaging each of the bushes with an interference fit, the alignment of apertures being in such direction that the spacer rod extends substantially at right angles to the general direction of the louvres.

4,081,938

STANDOFF INSULATED PANEL MOUNTING

Ralph Bertacchi, and Frederick R. Gorell, both of 55 E. Jackson, Chicago, Ill. 60604

Filed Dec. 13, 1976, Ser. No. 750,281
Int. Cl.[2] E04B *5/00*
U.S. Cl. 52—410 **4 Claims**



1. A support mounting for a prefabricated insulating panel having an outer metallic surface, a batt of insulating material and a backing therefor, comprising

(a) an elongated panel-supporting plate extending transversely of the panel beneath the outer metallic surface and between the batt of insulating material and the outer metallic surface,

(b) a rigid standoff member connected to one side of and extending perpendicularly to the panel-supporting plate,

(c) said standoff member providing an elongated hollow body adapted to be embedded in and extending through the batt of insulating material,

(d) a base member connected to the free end of said body exteriorly of the batt of insulating material and extending in substantially parallel relation to said panel-supporting plate and adapted to sit upon a fixed structural member so as to support the panel therefrom, with said standoff mem-

ber preventing displacement of the insulating panel onto the support under weight placed thereon, and

(e) means providing a connection between said base member and said free end of said body of said standoff member so as to attach said base member in a plane substantially parallel to said elongated panel-supporting plate.

4,081,939

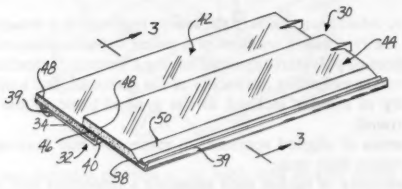
SIDING PANEL BACKERBOARD AND METHOD OF MANUFACTURING SAME

Bertram C. Culpepper, Jr., Linden, and Richard C. Wilson, Troy, both of Mich., assignors to Culpepper & Associates, Inc., Fenton, Mich.

Continuation of Ser. No. 657,190, Feb. 11, 1976, Pat. No. 4,033,802. This application Jun. 24, 1977, Ser. No. 809,902

Int. Cl.[2] E04D *1/10*

U.S. Cl. 52—535 **7 Claims**



1. A backerboard in a siding panel of the type having longitudinally disposed first and second walls connected by a longitudinal step wherein the siding panel is adapted to be fastened to the external wall sheathing of a building, and the backerboard is disposed between the inner surface of the siding panel wall and the exterior surface of said building, said backerboard comprising:

a first longitudinal member fabricated from a material having insulating qualities, said first member having a surface contour complementary to said first wall inner surface and abutting same;

a second longitudinal member fabricated from a material having insulating qualities, said second member having a surface contour complementary to said second wall inner surface and abutting same, said second member having a portion which overlaps a portion of said first member;

means fastening said overlapping portions of said first and second members such that the longitudinal edge of said first member adjacent said overlapping portions abuts the inner surface of said panel step when said backerboard is positioned in abutment with said panel wall inner surfaces.

4,081,940

SYSTEM AND APPARATUS FOR INTERCONNECTING STRUCTURAL MEMBERS, AND METHOD OF UTILIZING SAME

Robert S. Hughes, Southfield, Mich., assignor to Erecto-Pat Company, Oxford, Mich.

Continuation of Ser. No. 372,698, Jun. 22, 1973, Pat. No. 3,921,356. This application Oct. 14, 1975, Ser. No. 621,789

Int. Cl.[2] E04C *3/30, 5/18*

U.S. Cl. 52—712 **1 Claim**

1. An apparatus for facilitating the interconnection of a plurality of structural members, comprising, in combination:

a plurality of fastening means;

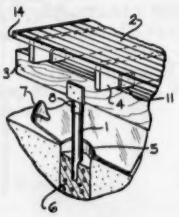
a plurality of said structural members;

and said apparatus includes:

at least one surface of said apparatus is provided with apertures to facilitate the passage therethrough of at least some of said fastening means which serve to fasten said apparatus to at least one of said structural members;

a first side provided with a series of said apertures which are aligned in a first predetermined direction;

a second side which is disposed substantially parallel to said first side and which is provided with a series of said apertures which are aligned in a second predetermined direction which is disposed substantially perpendicular to said first predetermined direction;



a third side which is unitary and integral with said first and second sides and which interconnects and maintains in a spaced apart relationship said first and second sides; and

said third side being provided with a plurality of said apertures to facilitate the passage therethrough of at least some of said fastening means.

4,081,941

FLEXIBLE PROTECTIVE COVER SECTIONS, ASSEMBLIES AND FORM SYSTEM

James G. Van Ausdall, Englewood, Colo., assignor to Ceel-Co, Denver, Colo.

Filed Oct. 18, 1976, Ser. No. 733,540

Int. Cl.[2] E02D *5/60*; E04C *3/34*

U.S. Cl. 52—726 **21 Claims**

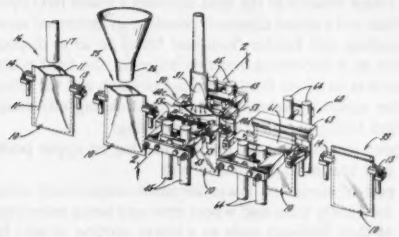
1. A flexible protective cover section for covering a structural shape and the like comprising a corrosion-resistant body that is preformed to a set shape substantially conforming to at least a portion of external surfaces of a structural shape arranged along intersecting planes, said body having an intermediate body portion and a pair of oppositely inner side body portions arranged at an angle with and connected to said intermediate body portion at a flexural joint body portion that flexes to change the angle between said intermediate body portion and said inner side body portions so that said body adjusts to cover a range of structural shape dimensions, the thickness of said body being between about 0.020 and 0.090 inches.

4,081,942

MACHINE AND METHOD FOR FILLING, INTRODUCING STEAM INTO, AND SEALING FLEXIBLE POUCHES

Kenneth R. Johnson, Rockford, Ill., assignor to Rexham Corporation, New York, N.Y.

Filed Aug. 2, 1976, Ser. No. 710,461
Int. Cl.² B65B *31/04*
U.S. Cl. 53—22 B **7 Claims**



5. A method of filling, steaming, closing and sealing pouches each defined by two face-to-face flexible panels, said method comprising the steps of advancing the pouches edgewise and open end up along a predetermined path and in ambient atmosphere through spaced filling and steaming stations, stopping each pouch first in said filling station and then in said steaming station, keeping the panels of each pouch spread away from one another to hold the upper end portion of the pouch in a widely open position while the pouch dwells in said filling station, as the pouch is being advanced from the filling station to the steaming station and while the pouch initially dwells in said steaming station, introducing product into each pouch while the pouch is dwelling in said filling station with its upper end portion held in said widely open position, introducing steam into each pouch through a nozzle while the pouch is initially dwelling in said steaming station and beneath said nozzle with the upper end portion of the pouch held in said widely open position, moving the panels of each pouch toward one another to move the upper end portion of the pouch to a closed position while directing steam toward the pouch and while the pouch is still dwelling beneath said nozzle, and sealing the upper end portion of each pouch after the pouch has been closed and before the pouch is advanced from beneath said nozzle thereby to prevent the introduction of air into the pouch.

4,081,943

APPARATUS AND METHOD FOR PRODUCING PACKAGES WITH INDIVIDUAL PRODUCT-FILLED CELLS

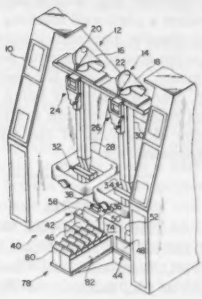
William C. Leasure, and Luis Garcia, both of Houston, Tex., assignors to Mira-Pak, Inc., Houston, Tex.

Filed Jan. 31, 1977, Ser. No. 764,090
Int. Cl.² B65b *9/12*; B65B *17/02, 35/40*
U.S. Cl. 53—26 **10 Claims**

9. A method of producing a package including a plurality of product-filled cells comprising the steps of;

forming, filling, and sealing at least a pair of individual product filled cells while maintaining said cells in side by side relation,

applying adhesive to one side of at least one of said sealed product filled cells,



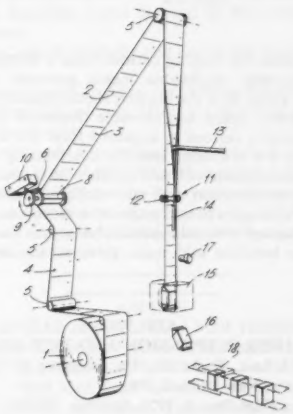
urging the cells into side by side contact with the adhesive coated surface therebetween so as to bond the cells together into a package.

4,081,944

ARRANGEMENT FOR THE READING OF PHOTOCELL MARKINGS ON A MATERIAL WEB PROVIDED WITH DECORATION

Uno Roland Sjöstrand, Flyinge, Sweden, assignor to AB Ziristor, Lund, Sweden

Filed Dec. 3, 1976, Ser. No. 747,097
Claims priority, application Sweden, Dec. 19, 1975, 7514444
Int. Cl.² B65B *41/18*
U.S. Cl. 53—51 **1 Claim**



1. In an apparatus for forming a tube-like member from a longitudinal web of packaging material provided with longitudinally spaced transverse creases and spaced transverse decorations thereon between the transverse creases and provided with photocell markings between the transverse decorations, in which the tube-like member is filled with a contents and then transversely sealed, shaped and severed into packages in register with the crease lines, the web and filled tube-like member being subject to elongation prior to the sealing, shaping and severing of the filled tube-like member, the improvement of means for controlling the register of the creases of the tube-like member, after filling with contents, with means for sealing, shaping and severing, said controlling means comprising means engagable with the spaced transverse creases on the web prior to formation of the web into the tube-like member and rotatable thereby, switch means responsive to said crease

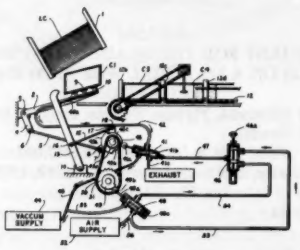
engaging means and operable intermittently thereby, a photocell disposed adjacent the filled tube-like member immediately preceeding the means for sealing, shaping and severing the filled tube-like member and intermittently activated by said switch means when a photocell marking is about to pass said photocell means thereby preventing activation of said photocell means while the spaced transverse decorations are passing said photocell means, said means for sealing, shaping and severing said filled tube-like member being activated when said photocell means reads a photocell marking on said tube-like member whereby elongation of the web and the tube-like member is compensated for.

4,081,945

PACKAGING MACHINE FOR USE WITH CARTONS OF DIFFERENT SIZES WITH MINIMUM ADJUSTMENT

Rodney K. Calvert, Dunwoody, and Charles Rabun Landrum, Doraville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 15, 1976, Ser. No. 742,056
Int. Cl.² B65B *43/28, 7/20*
U.S. Cl. 53—186 **14 Claims**



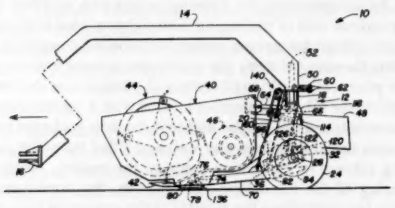
1. A machine for feeding cartons from a hopper, said machine comprising oscillatable means movable sequentially toward and away from the hopper, suction means mounted on said oscillatable means and movable therewith for engaging and withdrawing cartons in sequence from the hopper, main valve means for activating and for deactivating said suction means in synchronism with said oscillatable means, cam means movable in synchronism with said oscillatable means for controlling the operation of said main valve means, and pneumatic means connected with said main valve means for controlling cooperation between said main valve means and said cam means.

4,081,946

HEADER SUSPENSION AND LIFT MEANS

Philip J. Ehrhart, Rothsville, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 1, 1976, Ser. No. 746,561
Int. Cl.² A01D *47/00*
U.S. Cl. 56—14.4 **12 Claims**



1. In a crop harvesting machine having a crop harvesting header, a frame, means adapting said frame for movement in a forward direction across a field, said adapting means including a pair of wheel arms extending rearwardly from said frame, generally parallel to the forward direction and mounted proximate their respective forward ends to said frame at laterally spaced apart locations for vertical pivotal movement relative to said frame about a generally horizontal axis and a ground-engaging wheel rotatably mounted on each of said wheel arms at a location spaced rearwardly of the pivotal axis of said wheel arms, and lift means mounted on said frame and being actuatable to cause pivotal movement of said wheel arms relative to said frame and said wheels to effect upward lifting of said frame relative to the field between a lower field operating position and a raised transport position, an improved means for suspending said header from said frame so as to dispose said header in a harvesting position adjacent the field when said frame is at its lower field operating position and for lifting said header upwardly relative to said field during effectuation of upward lifting of said frame, comprising:

upper means pivotally interconnecting an upper portion of said header to said frame; and

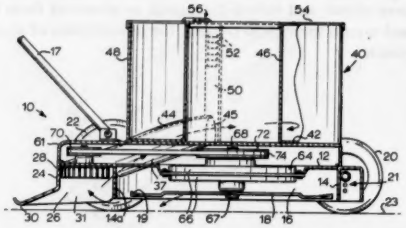
a pair of elongated lower members respectively extending forwardly from said wheel arms and being interconnected at their forward ends to a lower portion of said header, said lower members being mounted at locations proximate said respective forward ends of said wheel arms for vertical pivotal movement and having portions extending rearwardly of said mounting locations and within the path of pivotal movement of said wheel arms such that, during movement of said wheel arms to effect upward lifting of said frame relative to the field, said rearward extending portions of said lower members are engaged by said wheel arms and said lower members are thereby moved with said wheel arms to lift said header relative to the field.

4,081,947

ROTARY LAWN MOWER WITH SEPARATE GRASS PICK UP

Edward Szymanis, Midhurst, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Aug. 16, 1976, Ser. No. 714,974
Claims priority, application Canada, Aug. 21, 1975, 234102
Int. Cl.² A01D *87/10*
U.S. Cl. 56—13.3 **15 Claims**



1. In a rotary lawn mower comprising a cutting chamber designed to be supported by wheels and forwardly moved over a surface to be mown, said mower having a deck including a downwardly dependent skirt defining said cutting chamber, a cutting blade mounted within said chamber for rotary movement about a vertical axis, the improvement wherein said deck and skirt are essentially imperforate whereby discharge of cuttings from said chamber occurs by passage of said cuttings from beneath said skirt, and wherein grass collecting means including vacuum means is provided rearwardly of said cutting chamber and external thereto, said vacuum means comprising a vacuum chamber having an inlet proximate the mown surface and a rotary impeller vertically spaced from said surface.

4,081,948

MANUFACTURE OF BULKED YARN

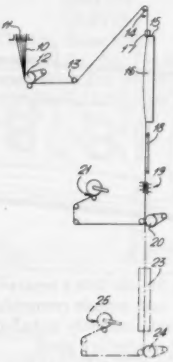
Walter Parker, Congleton, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Feb. 7, 1977, Ser. No. 766,071

Claims priority, application United Kingdom, Feb. 17, 1976, 6068/76

Int. Cl.[2] D02G *1/02*

U.S. Cl. 57—34 HS 15 Claims



4. Apparatus for the manufacture of bulked multi-filament yarns comprising means for melt-spinning a plurality of filaments, means for combining the filaments to form a yarn, means for texturising said yarn comprising heating means, cooling means and a false twist device, means for arresting the propagation of twist upstream from said false twist device at a point location substantially at the entry end of said heating means, means for drawing the yarn simultaneously with it being textured, and means for stabilising the draw point of the yarn on said heating means.

4,081,949

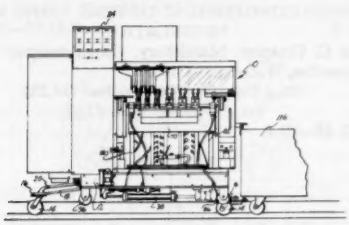
DOFFER WITH PNEUMATIC CONTROL SYSTEM

Alex J. Keller; Keith Sidney Dellinger; James Lester Ray, Jr., all of Gastonia; Thomas Adrian Cherry, Mooresville, all of N.C., and Erhard A. Fechner, Port Washington, N.Y., assignors to Automatic Material Handling, Inc., Bessemer City, N.C.

Filed Jan. 28, 1977, Ser. No. 763,662

Int. Cl.[2] D01H *9/10*

U.S. Cl. 57—53 10 Claims



7. Apparatus for donning and doffing bobbins onto and off the spindles of a spinning frame, said apparatus including:

(a) carriage means having transport means movable to a first position for causing said carriage means to move along said spinning frame, said transport means including engaging means associated therewith for selective engagement with an element fixed with respect to said spinning frame, said engaging means being movable between a first position out of engagement with said fixed element and a second position engaging said first element;

(b) bobbin donning and doffing means carried by said carriage means and arranged for initial movement to a first position at which at least one empty bobbin is donned onto a spindle and released, and for subsequent movement to a second position at which at least one full bobbin is doffed from a spindle;

(c) unloader means for receiving full bobbins doffed by said bobbin donning and doffing means, said unloader means being movable from a first position for receiving said full bobbins to a second position for ejecting said full bobbins;

(d) empty bobbin supply means for supplying empty bobbins to said bobbin donning and doffing means, said bobbin supply means being movable from a first position to receive an empty bobbin to a second position to supply an empty bobbin to said bobbin donning and doffing means;

(e) pneumatic sensor means disposed to emit a stream of air into the paths of movement of said transport means, said engaging means, said bobbin donning and doffing means, said unloader means, and said empty bobbin supply means, said sensor means generating:

(i) a first signal each time said airstream is interrupted by said transport means moving to said first position thereof;

(ii) a second signal each time said airstream is interrupted by said donning and doffing means moving to said first position thereof;

(iii) a third signal each time said airstream is interrupted by said donning and doffing means moving to said second position thereof;

(iv) a fourth signal each time said airstream is interrupted by and said unloader means moving to said second position thereof;

(v) a fifth signal each time said airstream is interrupted by said bobbin supply moving to said second position thereof; and

(vi) a sixth signal each time said airstream is interrupted by said engaging means moving to said second position thereof.

(f) control means receiving said pneumatic signals and operable:

(i) to move said donning and doffing means to said first position thereof only after said first pneumatic signal has been received;

(ii) to move said donning and doffing means to said second position thereof only after said second, fourth and fifth pneumatic signals have been received; and

(iii) to move said transport means to said first position thereof only after said third and sixth pneumatic signals have been received.

4,081,950

CALENDAR MECHANISM FOR TIMEPIECE

Jean-Maurice Chappatte, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Mar. 8, 1976, Ser. No. 664,883

Claims priority, application Switzerland, Mar. 18, 1975, 3405/75

Int. Cl.[2] G04B *19/24*; G09D *3/08*

U.S. Cl. 58—4 R 4 Claims

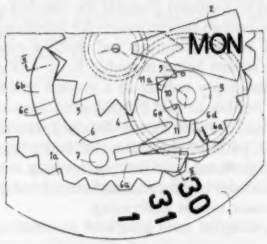
1. In a calendar mechanism for a timepiece having a clockwork, a first indicator for the day of the month and a second indicator for the day of the week, a driving member rotatable by said clockwork for indexing said indicators at the rate of one revolution for every twenty-four hours, each of said indicators having teeth by which they are simultaneously driven step-by-step by said driving member at the rate of one step for each twenty-four hours, a locking device for said indicators comprising

a locking lever articulated on the frame of the timepiece for reciprocal movement between operative and inoperative positions and having two integral arms for simultaneously restraining said indicators against movement when in such operative position,

one of said arms cooperating with the teeth of said first

indicator and the other of said arms cooperating with the teeth of said second indicator for restraining movement of said indicators when said locking lever is in its operative position,

said arms being disengaged from said teeth when said locking lever is in its inoperative position, thereby releasing said indicators,



said driving member and locking lever having means for urging said locking lever into its operative position and for releasing said locking lever so that it can move to its inoperative position while said indicators are being indexed.

4,081,951

ELECTRONIC TIMEPIECE

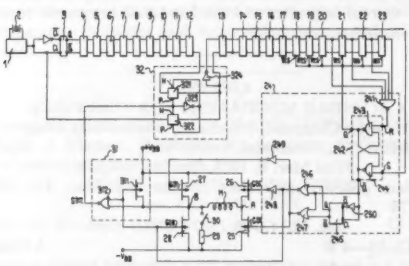
Pierre Hersberger, Neuchatel, Switzerland, assignor to Ebauches SA, Neuchatel, Switzerland

Filed Dec. 20, 1976, Ser. No. 752,429

Claims priority, application Switzerland, Dec. 23, 1975, 16674/75

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R **4 Claims**



1. An electronic time piece comprising: An oscillator; a frequency divider chain controlled by said oscillator and having a plurality of stages; a display device; a driver circuit for driving said display device under control of the output signals of said frequency divider chain; a short-circuit detector for detecting a short-circuit between an existing pole serving for connection of said driver circuit to said display device and a pole of the power supply; a selector controlled by said short-circuit detector, inserted between two of said divider chain stages and adapted to feed to the stage following the selector either the output signal of the preceeding stage of a higher frequency signal when said detector detects said short circuit.

4,081,952

WATCH MODULE FOR USE WITH SEPARATE POWER SOURCE

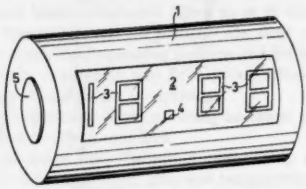
Rudolf Busch; Wolfgang Ganter, both of Schramberg, and Albert Ginter, Lauterbach, all of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Germany

Filed Jul. 15, 1976, Ser. No. 705,613

Claims priority, application Germany, Apr. 24, 1976, 2618097

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—50 R **5 Claims**



1. A clock module for use with a separate housing structure containing a battery, said module comprising:

an electrical operating assembly including:

a first elongated conductive plate,

a digital display mounted on said first plate,

a second elongated conductive plate,

a time keeping oscillator and an integrated electrical circuit mounted on said second plate, and

a main contact for engagement with a battery conductor of said separate structure, connected to said circuit,

said first and second plates being insulated from one another,

adjusting means for adjusting said digital recorder, and an elongated rod shaped housing surrounding said operating assembly, said housing including a longitudinal side wall portion and opposite end wall portions,

said digital display being visibly disposed at said longitudinal side wall portion of said housing,

said main contact being disposed on one end wall portion of said elongated housing and being exposed to the exterior of said housing so that said module may be installed within said separate structure, with said main contact being placed in electrical engagement with said battery of said separate structure.

4,081,953

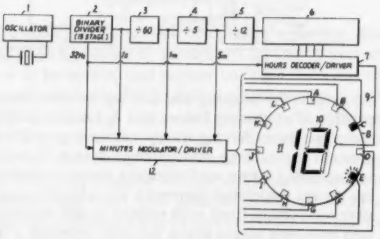
HYBRID HOROLOGICAL DISPLAY USING SPACE MODULATION

William C. Crutcher, Middlebury, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Dec. 27, 1976, Ser. No. 754,205

Int. Cl.[2] G04C *3/00, 17/00*

U.S. Cl. 58—50 R **5 Claims**



1. In an electronic timepiece of the type having a time base, a countdown dividing circuit connected to the output thereof,

and a decoder/driver connected to the output of said dividing circuit and actuating an electrooptic display of digits for the hours, the improvement comprising a minutes display having twelve selectively actuatable markers, and a modulator/driver for selectively actuating a first of said markers during a five minute interval and second ones of said markers in varying spaced relationship to the first marker so as to indicate the passage of minutes during five minute intervals.

4,081,954

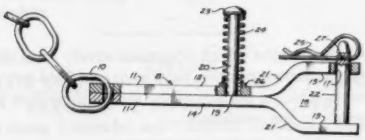
CLEVIS

Lee Fern Arnold, Clayton, Kans. 67629

Continuation-in-part of Ser. No. 736,093, Oct. 27, 1976, abandoned. This application Jun. 17, 1977, Ser. No. 807,573

Int. Cl.[2] F16G *15/04*; F16C *11/06*

U.S. Cl. 59—86 **5 Claims**



1. A clevis comprising:

a pair of narrow metal straps, each having a stem portion with at least one strap having a parallel offset segment defining a shackle area therebetween;

one of said straps having an elongated, perpendicular locking pin spanning the shackle area and extending through an aligned hole of the other strap in a first closed position of the clevis;

spring-loaded closing means urging the two straps into the first position with the stem portions in flat engagement;

said straps being moveable against the force of the spring into a second position, wherein the locking pin moves away from said other strap to provide a disengagement gap within the shackle area; and

means movably coupling the stem portions of the metal straps together.

4,081,955

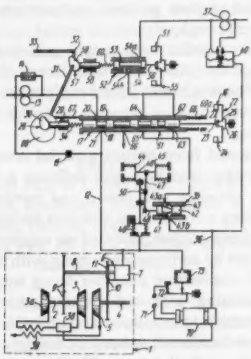
REGULATING SYSTEMS FOR TWO-SHAFT GAS-TURBINE ENGINE

Nikolai Nikolaevich Zakharov, ulitsa Dmitria Ulyanova, 9/11, korpus 2, kv. 64, Moscow, and Evgeny Borisovich Paramonov, ulitsa Volodarskogo, 50, kv. 50, Yaroslavl, both of U.S.S.R.

Filed Jan. 14, 1977, Ser. No. 759,376

Int. Cl.[2] F02C *9/04*

U.S. Cl. 60—39.16 S **3 Claims**



1. A regulating system for a two-shaft gas-turbine engine including a turbocompressor with its shaft, a power turbine with its shaft and a hydraulically-controlled torque-transmitting device interposed between said shafts, this system comprising: a fuel supply line of the engine; a hydraulic control line of said torque-transmitting device; a gas pedal; an all-speed regulator of the rpm value of said shaft of said turbocompressor, having a metering device, a pickup responsive to the rpm value of said shaft of said turbocompressor, and a mechanism for tuning said pickup, said metering device of said all-speed governor of the rpm value of said shaft of said turbocompressor being cut into said hydraulic control line of said torque-transmitting device; said pickup responsive to the rpm value of said shaft of said turbocompressor, belonging to said all-speed governor of the rpm value of said shaft of said turbocompressor, being adapted to develop control signals controlling said metering device of said all-speed governor of the rpm value of said shaft of said turbocompressor; said mechanism for tuning said pickup responsive to the rpm value of said shaft of said turbocompresssor being operatively connected with said gas pedal; a fuel feed regulator cut into said fuel supply line and controlled by the pressure at the outlet of the compressor of the engine; an all-speed governor of the rpm value of said shaft of said power turbine, having a metering device, a pickup responsive to the rpm value of said shaft of said power turbine and a mechanism for tuning said pickup, said metering device of said all-speed governor of the rpm value of said shaft of said power turbine being cut into said fuel supply line of the engine; said pickup responsive to the rpm value of said shaft of said power turbine, belonging to said all-speed governor of the rpm value of said shaft of said power turbine, being adapted to develop control signals controlling said metering device of said all-speed governor of the rpm value of said shaft of said power turbine; a mechanism for tuning said pickup responsive to the rpm value of said shaft of said power turbine, operatively connected with said mechanism for tuning said pickup responsive to the rpm value of said shaft of said turbocompressor, to provide for timed variation of the tuning of said two pickups.

4,081,956

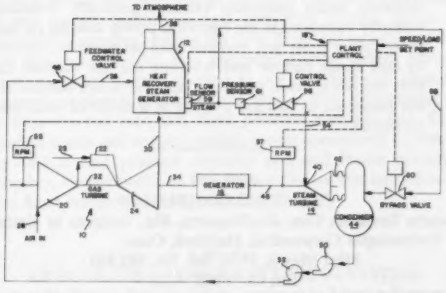
COMBINED GAS TURBINE AND STEAM TURBINE POWER PLANT

Jack M. Baker, Columbia, Mo.; Gordon W. Clark, Greenville, S.C.; Douglas M. Harper, Greenville, S.C., and Leroy O. Tomlinson, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 13, 1976, Ser. No. 685,979

Int. Cl.[2] F02C *7/00*; F02G *5/02*

U.S. Cl. 60—39.18 B **5 Claims**



1. A combined cycle steam and gas turbine power plant for generating electrical power to satisfy an electrical load which varies from a nominal load set point during normal operation of said power plant after power plant start-up, said power plant comprising:

at least one gas turbine having a compressor, a combustor and a turbine arranged in serial flow relationship, said combustor adapted to receive compressed air from said

compressor and fuel and generate a hot gas stream for driving said turbine, said turbine arranged in driving connection with said compressor and an electrical generator;

a heat recovery steam generator adapted to receive the hot gas stream exhausted by said gas turbine and a supply of water and generate steam;

a steam turbine arranged in driving connection with an electrical generator and having an inlet for receiving steam for driving said steam turbine and an outlet for discharging steam;

a first conduit for communicating steam generated by said heat recovery steam generator with said steam turbine inlet;

a second conduit for bypassing steam generated by said heat recovery steam generator from said steam turbine inlet;

a control valve disposed in said first conduit for adjusting steam flow to said steam turbine inlet;

a bypass valve disposed in said second conduit for adjusting steam flow through said second conduit;

means for sensing variations from said nominal load set point in the electrical power load to be satisfied by said power plant and for generating a load signal which is representative of said load variations;

a power plant control for controlling the electrical power generated by said power plant, said power plant control adapted to supply fuel to said gas turbine at a generally constant rate during normal operation of said power plant after power plant startup and including means, operative during normal operation of said power plant after power plant startup and responsive to said load signal, for increasing and decreasing the opening of said control valve in response, respectively, to increases and decreases in said power plant electrical load from said nominal load set point, said increase in the opening of said control valve, in the case of increases in power plant load from said nominal load set point, being sized to provide an increase in steam flow to said steam turbine which is sufficient to cause said steam turbine power output to be increased in the amount of said increase in power plant electrical load from said nominal load set point, said decrease in the opening of said control valve, in the case of decreased power plant load, being sized to provide a decrease in steam flow to the steam turbine which is sufficient to cause said steam turbine power output to be decreased in the amount of said decrease in power plant electrical load from said nominal load set point, and means for proportionately decreasing the opening of said bypass valve in response to increases in the opening of said control valve and for proportionately increasing the opening of said bypass valve in response to decreases in the opening of said control valve so that total steam flow from said heat recovery steam generator remains generally constant, whereby variations in the electrical power loading on said power plant from said nominal load set point are carried by said steam turbine and whereby the gas turbine, the heat recovery steam generator and the steam turbine are not subjected to thermal cycling as a result of such load variations.

4,081,957

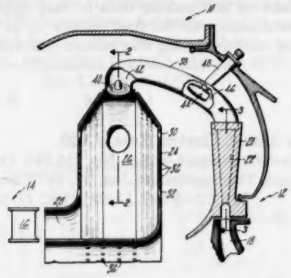
PREMIXED COMBUSTOR

George Benjamin Cox, Jr., Tequesta, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 3, 1976, Ser. No. 682,945
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.36 **5 Claims**

1. A combustion system for a gas turbine engine of the type having a pipe diffuser including incorporated therein an outwardly oriented diffusion passage, the system comprising:

a radial inflow, annular combustor having a first annular region through which the working medium gases are flowable in the radially inward direction, a flow swirler positioned at the outer circumference of the first annular region and through which a portion of the medium gases are flowable into the combustor, and a second annular region, extending axially rearward from the first annular region, through which working medium gases are flowable; and



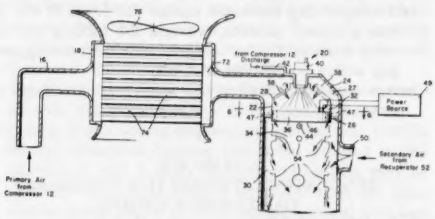
a flow transfer tube which communicatively joins said outwardly oriented diffusion passage to said flow swirler and through which a portion of the working medium gases is flowable to the combustor.

4,081,958

LOW NITRIC OXIDE EMISSION COMBUSTION SYSTEM FOR GAS TURBINES

Helmut R. Schelp, Pacific Palisades, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 411,868, Nov. 1, 1973, abandoned. This application Jan. 19, 1976, Ser. No. 649,935
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.51 R **17 Claims**



10. A combustion system for a gas turbine engine having an air compressor comprising:

a generally cylindrical casing;

a flame liner positioned within said casing and having a closed end portion, an open end portion, and wall openings therethrough;

impermeable annular wall means attached between said casing and said liner, said wall means defining an upper chamber between said closed end portion and said casing and a lower chamber between said open end portion and said casing;

a disc fashioned from porous material concentrically positioned within said liner and defining a fuel air mixture chamber between said closed end portion and said disc and defining a combustion chamber between said disc and said open end portion, said fuel-air mixture chamber being surrounded by and communicating with said upper chamber, said combustion chamber being surrounded by and communicating with said lower chamber, and said disc being operable to introduce a combustible fuel-air mixture to said combustion chamber for conflagration therein, said disc having radially outwardly increasing porosity such that the fuel-air mixture passes more readily through peripheral portions than through central portions

whereby turbulence is generated adjacent said disc in said combustion chamber;

a coating of platinum on said disc within said combustion chamber;

heater wires within said disc adapted for connection to a source of electrical energy for heating said disc;

a first conduit adapted for connection to the compressor and connected to said casing for conveying compressed air from the compressor to said upper chamber;

a first heat exchanger connected in said first conduit for cooling the compressed air conveyed to said upper chamber;

a second conduit adapted for connection to the compressor and connected to said casing for conveying compressed air from the compressor to said lower chamber;

a second heat exchanger connected in said second conduit for heating compressed air in said second conduit; and

means supplying fuel directly to the fuel-air mixture chamber for intermixing with compressed air from the upper chamber.

4,081,959

ARRANGEMENT FOR SUPPORTING A THERMAL REACTOR TO AN ENGINE PROPER

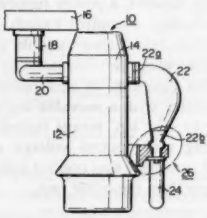
Akira Yokota, Yokosuka, and Yasuhiko Nakagawa, Kamakura, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 1, 1976, Ser. No. 701,836

Claims priority, application Japan, Jul. 29, 1975, 50-105466[U]

Int. Cl.² F01N *7/10*

U.S. Cl. 60—282 **6 Claims**



1. In an internal combustion engine system comprising an engine proper including a cylinder block and a cylinder head which are assembled together to define therebetween combustion chambers, said cylinder head being formed therein with exhaust ports communicable with said combustion chambers; a thermal reactor having at its one side exhaust gas inlet tubes connected in said exhaust ports of said cylinder head and at its other side an exhaust gas outlet duct; an exhaust tube having an open end in communication with said exhaust gas outlet duct of said thermal reactor for receiving the gases emitted from said thermal reactor before discharging into the open air, the improvement comprising a common bracket member mounted on said engine block and means mounting said outlet duct of said thermal reactor and said open end of said exhaust tube on said bracket member.

4,081,960

AIR FLOW CONTROL VALVE

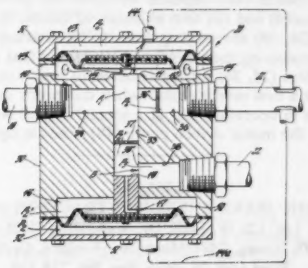
Raymond J. Haka, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 15, 1977, Ser. No. 768,737

Int. Cl.² F01N *3/15*

U.S. Cl. 60—289 **3 Claims**

1. An air flow control valve for use in the exhaust emission control system of an internal combustion engine wherein the system includes conduit means connected to the engine for receiving exhaust gases discharged from the exhaust ports of the engine and for delivering the exhaust gases serially through a reducing converter and an oxidizing converter and an air supply means for providing secondary air to said conduit means, said air flow control valve including a housing means having a first chamber with a boss upstanding centrally therein and a second chamber in spaced apart relation therein, a passage means in said housing means having one end opening through said boss into said first chamber and its opposite end opening into said second chamber, said housing further having an inlet connected to said air supply means and being in communication with said passage means adjacent to said one end, a first outlet in communication with said passage means adjacent to said one end and connectable to said conduit means upstream of said reducing converter, a second outlet in communication with said passage means adjacent to said other end and connectable to said conduit means intermediate said reducing converter and said oxidizing converter, a first fixed orifice in said first outlet, a second fixed orifice in said passage means intermediate the intersection of said first outlet and of said second outlet with said passage means, a first diaphragm positioned in said first chamber to divide said first chamber into a first pressure chamber on the side of said first diaphragm adjacent said port and a second pressure chamber on the opposite side of said first diaphragm, said first diaphragm being movable



relative to said boss to define with said passage means a variable orifice opening into said first pressure chamber, said housing means further having bypass port means in communication with said first pressure chamber, a second diaphragm positioned in said second chamber to divide said second chamber into a third pressure chamber on the one side of said second diaphragm next adjacent to said passage means and a fourth pressure chamber on the opposite side of said diaphragm, an apertured plunger means fixed to said one side of said second diaphragm, said apertured plunger means being slidably positioned in said opposite end of said passage means and extending an axial length into said passage means so that upon movement of said second diaphragm, said apertured plunger means is operable to variably control the flow from said passage means into said second outlet, said apertured plunger means having aperture means therein opening at one end into said passage means downstream of said second fixed orifice and opening at its opposite end into said third pressure chamber and, first conduit means and second conduit means operatively connecting said second pressure chamber and said fourth pressure chamber, respectively, to said first outlet on the side of said first fixed orifice therein opposite said inlet.

4,081,961

ARTICULATED VEHICLE STEERING SYSTEM

Robert M. Dwyer, Livonia, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Apr. 6, 1977, Ser. No. 785,133

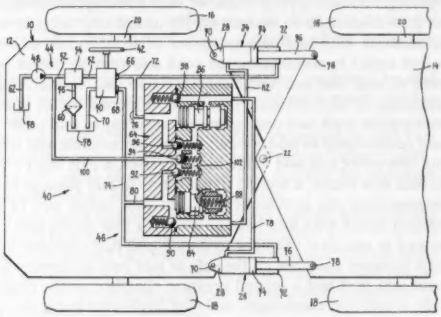
Int. Cl.² F15B *20/00*

U.S. Cl. 60—386 **8 Claims**

1. An articulated vehicle steering system including:

first and second double acting cylinders (24, 26) mechanically coupled together for steering an articulated vehicle (12, 14, 22);

a rotatable steering wheel (42); and
power steering means (44) consisting of a motor driven pump (48) and a hydrostatic steering unit (50), said steering wheel (42) being interconnected with said hydrostatic steering unit (50);
the improvement comprising



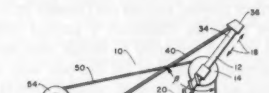
control means (46) disposed between the power steering means (44) and the first and second double acting cylinders (24, 26) for causing fluid to be directed from said power steering means (44) to both of said first and second cylinders (24, 26) during rotation of said steering wheel (42) at a first steering ratio when the motor driven pump (48) is in operation and at a second higher steerng ratio when the motor driven pump (48) is not in operation.

4,081,962

DYNAMIC WAVE ENERGY EXTRACTION SYSTEM

Francis C. Liu, 123 W. Loop Dr., Camarillo, Calif. 93010, and Kwang Ta Huang, 7241 Mesa Cir., Ventura, Calif. 93003

Filed Oct. 26, 1976, Ser. No. 735,726
Int. Cl.² E02B *9/08*
U.S. Cl. 60—501 **20 Claims**



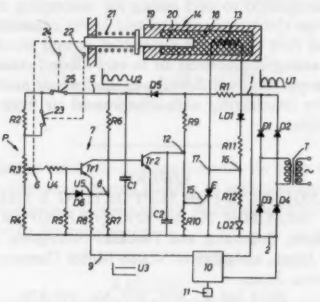
1. A dynamic wave energy extraction system comprising:
a. a buoyant body adapted to float on a body of water, said buoyant body having a predominant frequency of motion imparted thereto by surface wave movement;
b. spring bias means connected to said buoyant body including:
(1) a sheave support member attached to said buoyant body;
(2) a sheave slidably mounted on said support member; and
(3) a spring connected between said sheave and said buoyant body;
c. inertia means movably mounted to said sheave for applying forces in response to the motion of said buoyant body to said sheave of spring bias means, said spring bias means elastically countering said applied forces such that said sheave of spring bias means experiences oscillating movement with respect to said buoyant body, said spring bias means and said inertia means having a natural frequency.

4,081,963

CONTROL CIRCUIT FOR A SERVO-MOTOR

Flemming Stove, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Sep. 1, 1976, Ser. No. 719,458
Claims priority, application Germany, Sep. 10, 1975, 2540293
Int. Cl.² F03G *7/06*
U.S. Cl. 60—528 **5 Claims**



1. A control circuit for a servomotor of the type having a piston displaceable to selectable positions in one heating element and in the other direction by a return spring, said circuit comprising a heating element, a power supply circuit for said heating element including a control switch, first means for generating temperature responsive variable control voltage, second means for generating variable position voltages corresponding to different positions of said piston which means includes a potentiometer with a movable tap and means connecting said piston to said tap, means including comparator means for comparing said control voltage and said piston position voltage and operating said control switch when one of said voltages is larger than the other one.

4,081,964

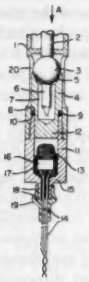
APPARATUS FOR THE THERMAL AND ELECTRICAL INITIATION OF FIRE PROTECTION DEVICES

Hellmut Bendler, Furth-Dammbach, and Anton Bretfeld, Nuremberg, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 662,290, Feb. 27, 1976, Pat. No. 4,043,128. This application Jul. 1, 1976, Ser. No. 701,810
Claims priority, application Germany, Jul. 4, 1975, 2529838
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.² F15B *15/06, 15/14;* F16K *17/40*
U.S. Cl. 60—636 **16 Claims**

1. Apparatus for the thermal and electrical initiation of fire protection devices comprising a housing with a displaceable support member and an abutment means provided therein, blocking means being disposed between said displaceable support member and said abutment means, said displaceable support member being biased against said blocking means in the direction toward said abutment means, said blocking means being responsive to the exceeding of a predetermined temperature for enabling displacement of said displaceable support member for initiating a fire protection device, said abutment means being constructed as a plunger means displaceable within said housing in the direction towards said displaceable support means, and an electrically actuatable compressed-gas-generating igniter means being disposed on the side of the plunger means facing away from said blocking means for producing compressed gas to cause displacement of said

plunger means toward said blocking means, said electrically actuatable igniter means including at least one electrical lead extending outwardly from said housing, and further comprising means for sealing at least the housing in the zone of the plunger means and said at least one electrical lead from outside influences.

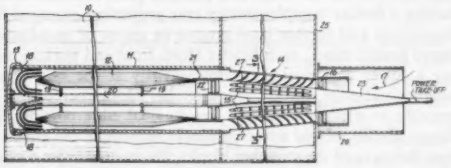


4,081,965

SOLAR OPERATED TURBINE POWER GENERATOR

Arie M. deGeus, 6625 4th St. South, St. Petersburg, Fla. 33705

Filed Mar. 3, 1977, Ser. No. 774,207
Int. Cl.[2] F03G 7/02
U.S. Cl. 60—641 6 Claims



1. A solar operated turbine power generator comprising a transparent tube contained within reflective means for concentrating solar energy upon said transparent tube, said tube being sealed at one end and having a tubular collector of radiant heat positioned concentrically within said tube, compressor means for taking air at atmospheric temperature and pressure and supplying it to the other end of said tube at an elevated pressure, said compressed air passing through said tube outside of said tubular collector and then passing back through said tube inside of said tubular collector to a turbine positioned within a housing concentrically positioned within said tube at said other end of said tube and sealed to said tubular collector, whereby said compressed air at the inlet to said turbine within said housing is heated to a temperature of at least about 300° C., exhaust means associated with said turbine for exhausting said heated compressed gases to the atmosphere through said turbine to drive the same, said exhaust means being in heat exchange relation to the compressed air at said other end of said tube so that a portion of the residual heat in the said turbine exhaust is recovered by the incoming air after it has been compressed.

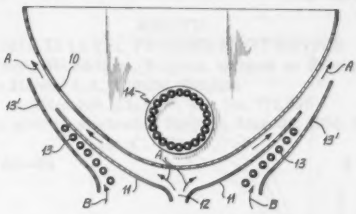
4,081,966

SOLAR OPERATED CLOSED SYSTEM POWER GENERATOR

Arie M. deGeus, 6625 - 4th St. South, St. Petersburg, 33705

Filed Mar. 3, 1977, Ser. No. 774,211
Int. Cl.[2] F03G 7/02
U.S. Cl. 60—641 4 Claims

1. A solor operated closed system power generator which utilizes a low boiling fluid comprising, parabolic reflector means for concentrating solar energy, an elongated boiler extending along the focus of said reflector, said reflector being dimensioned with respect to said boiler to vaporize the liquid which is supplied to said boiler against the elevated pressure prevailing therein, and to superheat the vapor so-produced, turbine means connected to said boiler for obtaining power by the expansion of said superheated vapor, means to convey the exhaust from said turbine to condenser means positioned in the shadow of said reflector, said condenser serving to liquefy the exhaust gases obtained from said turbine, said condenser being cooled by means of cooling air which is moved through the condenser by means of a draft provided by the convection discharge of air heated by said reflector, and pump means for transferring the liquefied exhaust gases in said condenser to said boiler at the greater pressure prevailing therein.

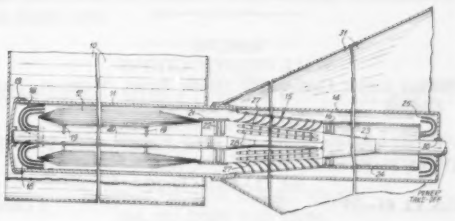


4,081,967

CLOSED CYCLE SOLAR GENERATOR

Arie M. deGeus, 6625 4th St. South, St. Petersburg, Fla. 33705

Filed Mar. 31, 1977, Ser. No. 783,422
Int. Cl.[2] F03G 7/02
U.S. Cl. 60—641 6 Claims

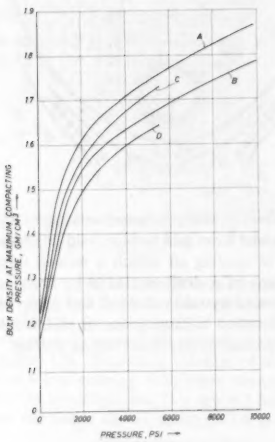


1. A closed cycle solar operated power generator comprising a transparent tube contained within reflective means for concentrating solar energy upon said transparent tube, said transparent tube being sealed at one end and having a tubular collector of radiant heat positioned concentrically within the same, compressor means for taking gas at low temperature and pressure and supplying it to the open end of said transparent tube at an elevated pressure, said compressed gas passing through said transparent tube outside of said tubular collector and then returning to the open end of said transparent tube inside of said tubular collector to a turbine positioned within a housing sealed to said tubular collector, a heat exchanger for receiving the turbine exhaust and for transferring heat therefrom to the compressed gases entering said transparent tube, a conductive tube sealed at one end having its open end sealed to the open end of the transparent tube, said conductive tube receiving the turbine exhaust from said heat exchanger, means for removing heat from said conductive tube, and a tubular compressor inlet for returning cooled gas passing through said conductive tube to said compressor to complete the closed cycle.

4,081,968
MINING OIL SHALE AND BACKFILLING WITH MECHANICALLY COMPRESSED SPENT SHALE

John E. Gwyn, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 16, 1977, Ser. No. 768,933
Int. Cl.[2] E02D *17/04*
U.S. Cl. 61—35 5 Claims

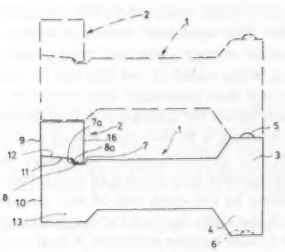


1. In a shale oil production process in which portions of a subterranean oil shale are mined out and retorted at a surface location, the improvement comprising, compressing substantially all of the spent shale to a volume at least substantially as small as that of the in situ volume of the oil shale from which the spent shale was derived, under a pressure of more than about 1,000 psi, and disposing the compressed spent shale within a mined out portion of the deposit.

4,081,969
WALL CONSTRUCTIONS

William Leslie Clarke, 182 Queen Street, Westport, New Zealand

Filed Oct. 4, 1976, Ser. No. 729,140
Claims priority, application New Zealand, Oct. 9, 1975, 178908; South Africa, Jan. 29, 1976, 0498
Int. Cl.[2] E02D *17/20*
U.S. Cl. 61—39 1 Claim

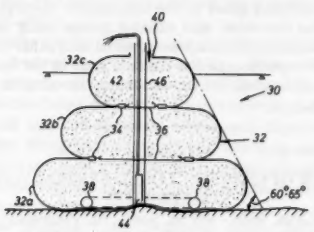


1. A means for erecting a retaining wall comprising a plurality of similar header blocks and a plurality of similar stretcher blocks arranged to be erected in tiered relationship, the header blocks each being elongated members arranged for disposition from the front to the rear of the wall in generally parallel relationship and each having a front end portion with a groove or recess inset from the header block front face in its upper surface and a rear end portion with upper and lower surfaces adapted to engage with lower and upper surfaces of similar next tiered header blocks, each stretcher block being an elongated member arranged for disposition longitudinally of the wall between the front end portions of adjacent tiered header blocks with the front faces of the stretcher and header blocks generally flush and having a longitudinal flange-like rear projection arranged for location in the front end portion groove or recess of the lower one of said adjacent tiered header blocks, and the upper face part of each header block front end portion between its front end face and its inset groove or recess being inclined inwardly and downwardly towards said groove or recess and the mating lower longitudinal face of each stretcher block having a complementary inclined formation, each header block rear end portion being of substantially T formation having upwardly and downwardly projecting flange portions, one of said rear end portions having a medial raised projection and the other of said flange portions having a complementary medial recessed disposition in opposition so that the projection of one header block can engage the recess of an adjacent tiered similar header block, a face of each header block front end portion between its front end face and its inset recess being inclined inwardly towards said groove or recess and the mating face of each stretcher block having a complementary inclined formation, the front end portion of each header block having a depending flange portion with a flat lower surface arranged to rest on the upper flat surface of a stretcher block therebelow so that the medial part of the header block is waisted relative to its end portions, each header block front end portion having a further inset groove or recess similar to the first-mentioned inset groove or recess but on the opposite face of the front end portion, each stretcher block having a further complementary rear projection arranged for location in said further inset groove or recess of an adjacent tiered header block, each header block front end portion having a lower part projecting downwardly at the rear upper longitudinal edge portion of a stretcher block therebelow to provide an abutment for said longitudinal edge portion; the flange portion of said stretcher blocks increasing the effective rear face area of the stretcher blocks, the tapered cross-section of the stretcher blocks enabling molding of the stretcher blocks by removal of the stretcher blocks from a mold.

4,081,970
UNDERWATER STRUCTURE

Brian Edward Wesley Dowse, Ontario, Canada, assignor to Golder Hoek and Associates Limited, Maidenhead, England

Filed Mar. 21, 1977, Ser. No. 779,801
Claims priority, application United Kingdom, Mar. 23, 1976, 11588/76; May 13, 1976, 19878/76
The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.
Int. Cl.[2] E02D *27/22, 27/52*
U.S. Cl. 61—88 7 Claims



1. A method of forming an underwater structure, comprising fabricating an impervious inflatable membrane to form a substantially totally enclosed container, the membrane when inflated being elongate and having a cross-sectional shape consisting of a series of superimposed bulbous sections of progres-

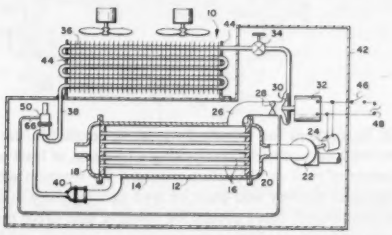
sively smaller area considered in an upward direction; transporting the membrane in a collapsed condition to the site; inflating the membrane to permit or cause a base portion thereof to rest on the river or sea bed; filling the membrane with a non-settable particulate material to form a body of such material; and draining the particulate body to enable the external water pressure to exert a confining pressure on the body to render it coherent.

4,081,971

AIR COOLED CENTRIFUGAL REFRIGERATION MACHINE WITH PROVISION TO PREVENT EVAPORATOR FREEZING

David Henry Eber, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Sep. 17, 1976, Ser. No. 724,185
Int. Cl.[2] F25B *41/04*
U.S. Cl. 62—216 10 Claims



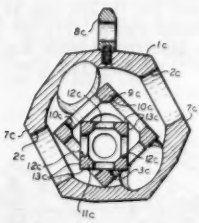
1. A refrigerant system comprising an evaporator, compressor, condenser and refrigerant liquid throttling means connected respectively in a closed refrigerant loop; valve means disposed in said loop between the outlet of said condenser and the inlet of said evaporator; valve operator means for operating said valve; a vent line extending from said valve operator means to the inlet of said compressor; and vent line being disposed to bypass said evaporator; and a controllable gas throttling means disposed between said evaporator and said compressor, said vent line connecting to said loop between said gas throttling means and said compressor.

4,081,972

PENDANT, EARRING OR PIECE OF JEWELRY

Daniel Kotlar, 50 Charles St., New Rochelle, N.Y. 10801

Filed Jun. 2, 1976, Ser. No. 691,993
Int. Cl.[2] A44C *17/00*
U.S. Cl. 63—31 3 Claims



1. A piece of jewelry comprising

a hollow multi-faced outside cage-like casing having a plurality of substantially circular openings in its peripheral surfaces,

at least one body disposed inside of said outside cage-like casing,

the dimensions of said body being larger than those of said circular openings, to prevent escape from said casing, and

said body being freely movable within said outside cage-like casing,

said outside casing being interiorly solid prior to rendering it cage-like, and

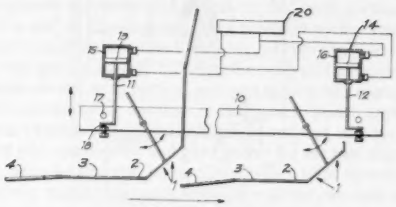
said body being formed out of said solid interior and then separated from said casing.

4,081,973

MULTI LEVEL PRESSER-FOOT DEVICE

Andre Theys, Wondelgem, Belgium, assignor to Fabrique Nationale Herstal S.A., Herstal, Belgium

Filed Feb. 23, 1977, Ser. No. 771,337
Claims priority, application Belgium, Mar. 31, 1976, 254921
Int. Cl.[2] D04B *7/04*
U.S. Cl. 66—64 6 Claims



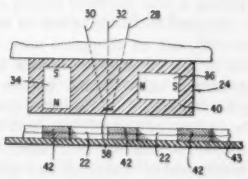
1. In a straight bar knitting machine having double V-shaped needle beds that support and guide independently moveable needles, a program control for the knitting machine, a presser foot arranged to reciprocate along and between the needles, th improvement comprising means automatically responsive to the program control for adjusting the level at which the presser foot reciprocates between either of two preselected levels, one of said levels being above the top of the needle beds and just below the path of travel of the needles, the other of said levels being between and closely adjacent the top edges of the needle beds.

4,081,974

KNITTING MACHINE CARRIAGE WITH HALL EFFECT DETECTING MEANS

Wolfgang Jaffe, Roselle Park, and Joseph James Lukawich, Somerville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,049
Int. Cl.[2] D04B *7/00, 15/66*
U.S. Cl. 66—75.2 2 Claims



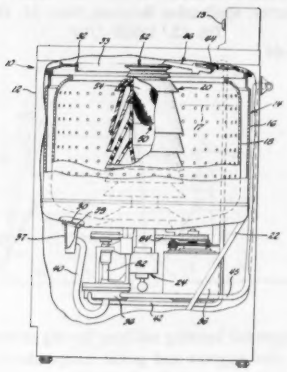
1. In a flat bed knitting machine including a slotted needle bed and carriage slidable on the bed, a pair of dual magnet Hall-effect devices on the carriage disposed to move across slots in the bed as the carriage is moved and subject to actuation by steel in the bed as the devices move between the slots, and circuit means responsive to the operation of the Hall-effect devices, the Hall-effect devices being so located with respect to the slots in the bed as to generate out-or-phase signals from which the direction of carriage motion can be determined.

4,081,975

CLOTHES WASHER WITH CENTERPOST MOUNTED LINT FILTER BAG

Otis W. Wortham, Springfield, and John A. Sundstrom, Springboro, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 22, 1977, Ser. No. 790,075
Int. Cl.[2] D06F *39/10*
U.S. Cl. 68—18 FA 3 Claims



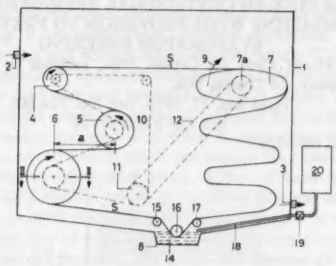
1. In an automatic clothes washing machine having a rotatable, perforate inner tub including a hollow open-top rotatable and vertically reciprocable agitator, a nonrotatable imperforate outer tub surrounding said inner tub and adapted to receive washing liquid from said inner tub, said outer tub having an outlet for removing washing liquid and a top access opening exposing the open-top of said agitator and through which clothes may be loaded into the washing liquid in said inner tub, a pump associated with said access opening and said outlet and operable for recirculating liquid to said inner tub through a hose end adjacent the open-top of said agitator, and drive means to reciprocate said agitator for washing said clothes while the pump is recirculating fluid, the improvement for removing and aggregating solid contaminants from recirculating liquid comprising a filter assembly having a support manually removably fastened to the open-top of said agitator for movement therewith, and an elongated mesh bag carried by said support and depending into the hollow of said agitator, said mesh bag having sidewall and bottom wall portions adapted during recirculation to hang above the level of washing liquid in the hollow of said agitator, and spray means on said hose end adapted to receive recirculating liquid from said hose end and configured to straighten and soften the flow of said recirculating liquid to prevent the aeration thereof while directing said flow through said mesh bag as said agitator reciprocates thereby to remove contaminants from the recirculating liquid by depositing said contaminants on the inside of said sidewall, the shaking of said bag effected by the reciprocation of said agitator and the flow of said recirculating water through said mesh bag cooperating to force and flush the deposited contaminants downwardly thereby to self-clean said sidewall of said contaminants while compacting said contaminants into a wad in the bottom wall portion of said bag for easy manual disposal thereof through the open-top of said agitator.

4,081,976

EQUIPMENT FOR THE TREATMENT OF TEXTILES IN THE FORM OF HANKS OR WEBS WITH LIQUID OR PASTES

David Moreinis-Eisen, Apartado Aereo 4897, Bogota d.E., Colombia

Continuation of Ser. No. 594,990, Jul. 11, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,641
Int. Cl.[2] D06B *3/20*
U.S. Cl. 68—19 6 Claims



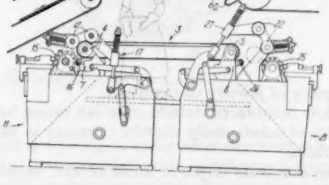
1. Equipment for repeatedly treating textiles in the form of discrete hanks or webs comprising a housing, at least one drive member of oval cross-section mounted for rotation within said housing to convey said hank or web downwardly in a serpentine movement, drive means for rotating said drive member, a liquid or paste applicator device in said housing, guide means positioned to receive said downwardly conveyed hank or web and to guide said received hank or web relative to said applicator for the application of said liquid or paste to said hank or web, at least two centrifugingelements positioned in said housing to receive said hank or web after application of said liquid or paste and to return said hank or web to said drive member, wherein the wrap-round angle of the hank or web on each centrifuging element is at least 90°, and means to rotate said centrifuging elements at different circumferential speeds respectively, thereby to evenly distribute the liquid or paste, applied to the hank or web, throughout the hank or web in cross-section, in the wrap-round zone of the centrifuging elements, under the influence of the pressure on the centrifuging elements and the centrifugal force generated by these, and to centrifuge off the excess liquid or paste.

4,081,977

DE-FLESHING APPARATUS FOR ANIMAL HIDES

Alexander Schmidt, Sr.; Walter Schmidt, and Alexander Schmidt, Jr., all of Weiz, Austria, assignors to USM Corporation, Boston, Mass.

Continuation of Ser. No. 714,275, Aug. 13, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 806,200
Claims priority, application Austria, Aug. 14, 1975, 6372/75
Int. Cl.[2] C14B *1/10*
U.S. Cl. 69—42 1 Claim



1. A machine for defleshing animal hides, comprising:

two de-fleshing machines arranged symmetrically back to back, each machine having a cutter roll and a feed roll and at least one pressure roll pressing the hide against the feed roll, whereby both de-fleshing machines are connected together by a conveyor belt which is movable in opposite directions,

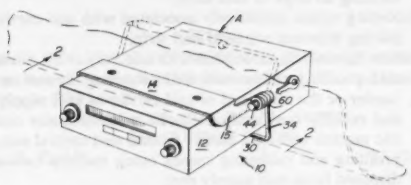
said conveyor belt being guided around the feed roll of one de-fleshing machine, and said conveyor belt is also guided around the feed roll of the second de-fleshing machine.

4,081,978

MOBILE RADIO SECURITY DEVICE

Hollis L. Ivey, 1305 E. 14th St., Lumberton, N.C. 28358

Filed Nov. 2, 1976, Ser. No. 738,009
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—58 **8 Claims**



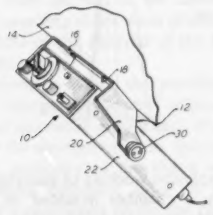
1. A mobile radio and electronic equipment security device comprising; first means for replacing the conventional mounting bolts as used with the normal mounting bracket of mobile radio and electronic equipment devices, second means engageable with the first means for positively securing same, and locking means associated with the first and second means for preventing unauthorized opening of the overall device, the locking means including an entirely separate lock structure, the first means including at least one eyebolt member provided with equipment engaging means at the end thereof opposite to the eye structure, and the second means including a pivotally mounted primary security rod associated with the eye of the eyebolt and a secondary security rod lockable at the other end with the said locking means, the second means further including adjusting means for ready adjustment of the length of the security rod members to whatever size the mobile equipment device may be, the secondary rod member being provided at the end opposite to the adjusting means with an eye construction, and a second eyebolt member is provided with means for attachment to the mobile equipment device, and with the eye thereof in position for association with the eye construction on the end of the secondary rod member for appropriate locking by the said locking means.

4,081,979

LOCKING FASTENER ASSEMBLY

Raymond B. Dawson, Berkeley Heights, N.J., assignor to Super Stud Products, Inc., Berkeley Heights, N.J.

Filed Nov. 24, 1976, Ser. No. 744,629
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—58 **11 Claims**



1. A locking fastener assembly for securing electronic equipment or the like to a mounting bracket or the like, comprising in combination:

a stud assembly comprising a threaded shank portion for passing through an opening in said mounting bracket and being threadingly receivable in an opening at said equipment, and an enlarged head portion at one end of said shank portion having a plurality of openings for receiving engaging pins therein from a cooperating tool, the spatial pattern of said openings defining a plurality of different spacings between selected pairs of said openings;

an annular collar surrounding said head portion and projecting in a direction opposite said threaded shank to at least cover the rim of said head portion, said collar being freely rotatable about said head portion to prevent grasping thereof by a tool;

a tool member having a face opposable to said collar and head portions, said face including a plurality of openings in a pattern mirroring said pattern on said head portion;

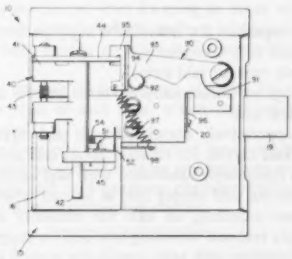
at least a pair of engaging pins being provided within a pair of said openings in said tool member, whereby by overlying said pattern on said tool member with said mirroring pattern on said head portion, said pair of pins may engage with corresponding openings in said head to permit application of torque to tighten and loosen said stud assembly; all of said openings on said head except for the pair alignable with the said pins being closed with a filler material, whereby engagement with said tool member can only be effected when said pin pair is keyed with the alignable pair of openings on said head portion.

4,081,980

ELECTRIC SECURITY LOCK

Tafari Hightower, 765 Rand Ave., Oakland, Calif. 94610

Filed Jan. 26, 1976, Ser. No. 652,103
Int. Cl.[2] E05B *65/10*
U.S. Cl. 70—92 **4 Claims**



1. In an electric security lock including:

a. a dead bolt;

b. a frame, having a top side and a bottom side, with said bottom side adapted to slideably receive said dead bolt;

c. a cover plate coupled to said bottom side of said frame and adapted to secure said dead bolt in place;

d. a pair of rotating cams coupled to said dead bolt and adapted to move said dead bolt in a lateral direction; and

e. a locking cylinder, which includes a mounting member coupled to said top of said frame and a mechanical coupling member coupled to said cam, an electric activating apparatus comprising:

a. a circular latch member pivotably connected and spring coupled to said dead bolt;

b. a metal bar having a first end and a second end and also having a square hole disposed between said first and second ends adapted to be mechanically coupled and uncoupled to said circular latch member, said metal bar being disposed in a slot in said bottom of said frame, said slot being disposed parallel and adjacent to said dead

bolt in said frame, said frame also having a square window disposed along said slot; and

c. a micro electronic switch disposed on said bottom of said frame adjacent to said slot and coupled to said metal bar through said square window of said frame.

4,081,981

APPARATUS FOR PRODUCING A PIPE FROM METAL STRIP

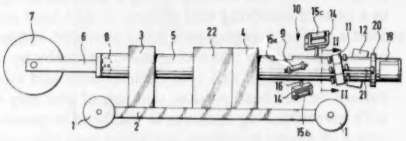
Xaver Lipp, 7091 Tannhausen, Ostalbkreis, Germany

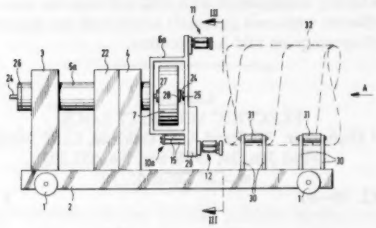
Filed Jan. 16, 1976, Ser. No. 649,676

Claims priority, application Germany, Jan. 18, 1975, 2501943; Nov. 28, 1975, 2553481

Int. Cl.² B21C *37/12*; B21D *11/06*

U.S. Cl. 72—49 **10 Claims**





1. An apparatus for manufacturing pipe from an elongated sheet metal strip comprising

a supply reel for said strip;

an elongated horizontally mounted hollow carrier having a central axis;

means operatively associated with said carrier for supporting said carrier for rotation about said central axis;

means operatively associated with said carrier for rotatably mounting said supply reel at an end of said carrier, said means including an axle for rotatably supporting said supply reel and mounting brackets for supporting said axle for rotation with said carrier, the central axis of said axle being perpendicular to the central axis of said carrier;

profiling means operatively associated with said carrier for forming an edge of said strip;

rabbeting means operatively associated with said carrier for joining adjacent edges of said strip;

means operatively associated with said carrier for mounting said profiling means and said rabbeting means on and radially outwardly of said carrier near the opposite end of said carrier from said supply reel for concentric motion with said carrier around said central axis;

means in said carrier defining an opening through a side wall thereof through which said strip can radially pass, said opening being located between said means for mounting said supply reel and said means for mounting said profiling means and rabbeting means;

guide means operatively associated with said carrier for guiding strip withdrawn from said supply reel longitudinally through said carrier parallel with said central axis of said carrier and generally radially through said opening to said profiling and rabbeting means in a generally circular path concentric with said central axis,

whereby said strip is joined to itself in a helical path surrounding said carrier to form an elongated pipe.

7. An apparatus for manufacturing pipe from an elongated sheet metal strip comprising

a supply reel for said strip;

an elongated horizontally mounted generally cylindrical carrier having a central axis;

means operatively associated with said carrier for supporting said carrier for rotation about said central axis;

means operatively associated with said carrier for rotatably mounting said supply reel at an end of said carrier, said means including an axle for rotatably supporting said supply reel and a mounting bracket for supporting said axle for rotation relative to said carrier, the central axis of said axle being parallel to the central axis of said carrier;

profiling means operatively associated with said carrier for forming an edge of said strip;

rabbeting means operatively associated with said carrier for joining adjacent edges of said strip;

means operatively associated with said carrier for mounting said profiling means and said rabbeting means on said carrier or the same end of said carrier as said supply reel and radially outwardly thereof for substantially concentric motion with said carrier around said central axis, said profiling and rabbeting means being radially outwardly disposed from said supply reel;

guide means operatively associated with said carrier for guiding strip withdrawn from said supply reel and generally radially outwardly to said profiling and rabbeting means in a generally circular path substantially concentric with said central axis,

whereby said strip is formed at its edges by said profiling means and joined to itself by said rabbeting means in a helical path to form an elongated pipe around a central axis substantially aligned with the central axis of said carrier.

4,081,982

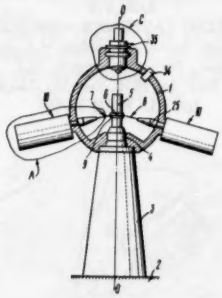
PLANT FOR EXPLOSION WORKING OF MATERIALS

Vladilen Fedorovich Minin, ulitsa Tereshkovoi, 36a, kv. 14; Vitaly Stepanovich Gambarov, ulitsa Promyshlennaya, 8, kv. 73; Mikhail Samuilovich Kachan, ulitsa Pravdy, 9, kv. 38; Vladlen Alexeevich Okladnikov, ulitsa Oleko Dundicha, 29, kv. 13; Boris Leonidovich Troinin, ulitsa Grekova, 13, and Jury Alexeevich Trishin, ulitsa Zolotodolinskaya, 9, kv. 5, all of Novosibirsk, U.S.S.R.

Filed Oct. 12, 1976, Ser. No. 731,412

Int. Cl.² B21D *26/12*

U.S. Cl. 72—56 **5 Claims**



1. A plant for explosion working of materials, comprising: a stationary support; a chamber mounted on said stationary support; a work table accommodated within said chamber and adapted to support thereon a material to be worked upon, the material having a charge of an explosive applied thereon, the explosive having means for initiating an explosion embedded

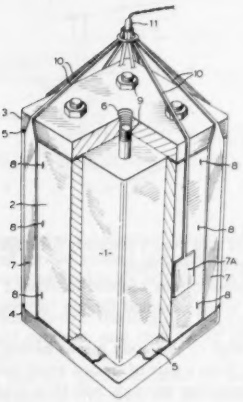
therein; at least one electrode for furnishing an electric pulse to said explosion initiating means, said at least one electrode being mounted in said chamber for an advancing motion towards said explosion initiating means into electric contact with said explosion initiating means; movement means for effecting said advancing motion of said at least one electrode toward said explosion initiating means by a distance equalling the length of the portion of said electrode separated therefrom by an explosion; and ventilation means mounted in said chamber and adapted to remove therefrom the products of detonation of said explosive charge.

4,081,983

MOLDS FOR THE CONTINUOUS CASTING OF METALS

Lorne Russell Shrum, 820 Manchester Road, London, Ontario, Canada (N6H 4J6)

Filed Mar. 29, 1977, Ser. No. 782,364
Int. Cl.² B21D *26/08*
U.S. Cl. 72—56 **10 Claims**



1. In a method of forming tubular copper molds for the continuous casting of metals, in which an arbor is formed having an external surface having the profile and finish required of the finished mold, a copper sleeve of the same general shape as the mold is fitted on the arbor, charges of high explosive material extending longitudinally substantially parallel to the longitudinal axis of the mold are applied to the exterior of the sleeve so as to provide detonation paths extending from one end of the sleeve to the other, air is evacuated from between the sleeve and the arbor, the sleeve with the charges applied thereto is fully immersed in a liquid, and the charges are detonated from one end of the sleeve so as to apply a longitudinally travelling shock wave of sufficient magnitude to cause plastic flow of the material of the sleeve into intimate contact with the arbor,

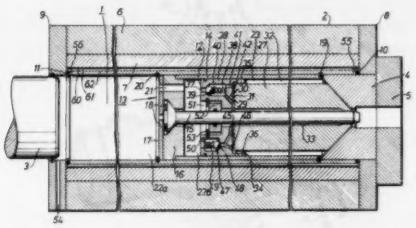
the improvement in which the plurality of longitudinally extending charges are applied adjacent the sleeve in a plurality of successive groups each of at least one charge, charges in the same group being spaced from one another about the periphery of the sleeve and each group of charges being detonated prior to the application of charges of a succeeding group, the charges in successive groups being distributed so that at least one charge is detonated adjacent every portion of the external surface of the sleeve.

4,081,984

PROTECTIVE COATING FOR REMOVABLE LINER OF PRESS FOR HYDROSTATIC EXTRUSION

Sven-Göran Gustafsson, Vesteras; Jan Nilsson, Robertsfors, and Pertti Syvikari, Helsingborg, all of Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Apr. 18, 1977, Ser. No. 788,665
Claims priority, application Sweden, Apr. 22, 1976, 7604613
Int. Cl.² B21D *22/10*
U.S. Cl. 72—60 **11 Claims**



1. A press for the hydrostatic extrusion of metallic billets which includes:

an elongated high pressure cylinder which has a hollow interior and which has openings at the ends thereof, the hollow interior forming a pressure chamber;

a die positioned to close to one of said openings in said high pressure cylinder, said die including a passageway therein through which metal may be extruded in order to form a tube or other profile;

a punch which is insertable through the other of said openings in said high pressure cylinder and which can project into said pressure cylinder to a predetermined point in order to generate a pressure in said pressure chamber for extrusion of a metallic billet through said passageway in said die;

a removably positioned liner forming an inner wall of said high pressure cylinder which encloses said pressure chamber, said liner having an inner wall facing said pressure chamber;

a protective coating of an organic polymer located along said inner wall of said liner which faces said pressure chamber; and

means in the form of a tube positioned in concentric fashion adjacent said protective coating and between said protective coating and said pressure chamber for mechanical protection of said protective coating.

4,081,985

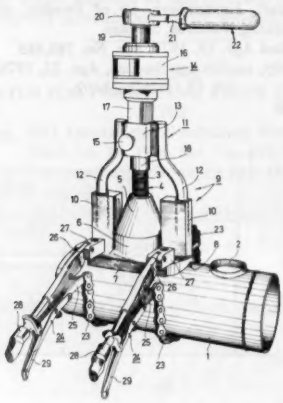
TOOL FOR FORMING NECKS ON CIRCUMFERENTIAL SURFACES OF PIPES

Günter Rothenberger, Bad Homburg, von der Hohe, Germany, assignor to Rothenberger GmbH & Co. Werkzeugeuge-Maschinen, Frankfurt am Main, Germany

Filed Mar. 11, 1976, Ser. No. 666,117
Claims priority, application Germany, Mar. 15, 1975, 7508218[U]
Int. Cl.² B21D *51/40*
U.S. Cl. 72—117 **5 Claims**

1. In a portable necking-out hand-tool for forming projecting cylindrical nipples on the circumferential wall of a pipe, container or the like, having screw plug means with hook-shaped forming head means and thrust sleeve means provided with coaxial downholder flange means for cooperation with the forming head means and the screw plug means, said thrust means having a hollow cylindrical interior corresponding to the contour of the forming head means for the reception of the formed nipple, the improvement which comprises non-rotatable, symmetrical telescopic guide means associated with the thrust sleeve means for mounting torque converter means on

the screw plug means for effecting the continuous rotation of the hook-shaped forming head means, the telescopic guide means comprising two tubular members symmetrically attached to the thrust sleeve means parallel to the screw plug means, U-shaped stirrup means having parallel legs slidably received into the tubular members and yoke means incorporating a fitting for the reception of the torque converter means.

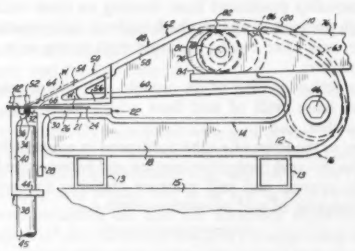


4,081,986

WIDE-RANGE SHEET MATERIAL BENDING BRAKE

Douglas G. Break, Farmington, Mich., assignor to American Industrial Products, Inc., Livonia, Mich.

Filed Dec. 27, 1976, Ser. No. 754,735
Int. Cl.² B21D *5/04*
U.S. Cl. 72—320 **4 Claims**



1. A wide-range sheet material bending brake, comprising

a stationary workpiece-claping structure including a plurality of stationary elongated clamping jaw supports disposed in laterally-spaced aligned relationship,

said stationary workpiece clamping jaw supports having forward and rearward end portions,

said stationary workpiece-clamping structure having a stationary workpiece-clamping jaw mounted on and extending between said stationary forward end portions in interconnecting relationship therewith,

a movable workpiece-clamping structure including a plurality of movable elongated-clamping jaw arms disposed in laterally-spaced aligned relationship,

said movable workpiece-clamping jaw arms having forward and rearward end portions,

said movable workpiece-clamping structure having a workpiece-clamping jaw mounted on and extending between said movable forward end portions in interconnecting relationship therewith,

said movable workpiece-clamping jaw having a forward workpiece-bending edge,

said stationary workpiece-clamping jaw having a forward edge with hinge means thereon disposed below said workpiece-bending edge with the pivot of said hinge means disposed in substantially vertical alignment with said workpiece-bending edge,

said stationary workpiece-clamping jaw supports being approximately J-shaped with substantially horizontal forward portions and with upstanding arcuate rearward portions,

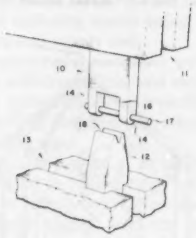
said rearward end portions of said movable workpiece-clamping jaw arms being of downwardly and rearwardly extending arcuate configuration.

4,081,987

CURLING PUNCH

Larry Baker Hall, Smyrna, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Apr. 11, 1977, Ser. No. 786,459
Int. Cl.² B21D *5/01*
U.S. Cl. 72—389 **5 Claims**



1. A machine tool punch assembly for edge curling of sheet metal workpieces comprising:

a body member means adapted to depend from a machine tool ram when mounted therein to present a body edge distal from the ram;

said distal edge of the body means having an intermediate cutout to form a pair of spaced apart tang projections;

a passage extending through each tang projection, said passages located so as to be in coaxial alignment;

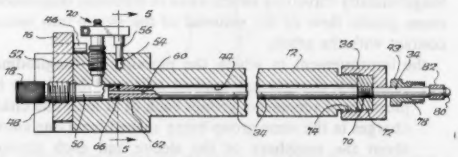
and a removable rod means extending through both tang passages and across the cutout between the tang projections.

4,081,988

PRESSURE TRANSDUCER CALIBRATION

Nicholas D. Change, West Seneca, and Michael T. Riggs, Batavia, both of N.Y., assignors to PCB Piezotronics, Inc., Depew, N.Y.

Filed Mar. 18, 1977, Ser. No. 779,255
Int. Cl.² G01L *27/00*
U.S. Cl. 73—4 R **11 Claims**



1. In combination with ammunition testing apparatus comprising an elongated test barrel, means adjacent one end of said barrel for holding a cartridge to be test fired in said barrel and transducer means mounted in said barrel to be in operative

contact with a cartridge to be tested for converting pressure changes into electrical signals, calibration means comprising:

a. a pressure tube element adapted to fit in said test barrel and extend along within said test barrel, said tube element being of sufficient length such that one end is received within an empty cartridge casing held in said barrel and the opposite end of said tube element is adjacent the other end of said barrel;

b. means on said one end of said tube providing a pressure-tight relationship with the interior of the empty cartridge casing;

c. means adjacent said opposite end of said tube engaging said barrel for holding said tube rigidly in said barrel; and

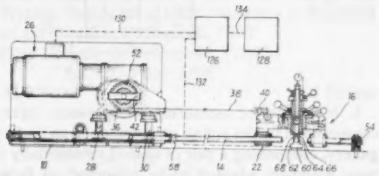
d. calibration pressure supply means connected to said tube for introducing known calibration pressure to the interior of said empty cartridge casing.

4,081,989

DEVICE FOR MEASURING THE STRESS OF TANGENTIAL FRICTION OF A SHOE ON A SURFACING FOR THE GROUND

Richard Majcherczyk, Boulogne-Billancourt, France, assignor to Centre Experimental de Recherches et d'Etudes du Batiment et des Travaux Publics, France

Filed Jan. 24, 1977, Ser. No. 761,472
Int. Cl.[2] G01N *19/02*
U.S. Cl. 73—9 **3 Claims**



1. Device for measuring the stress of tangential friction of a shoe on a surfacing for the ground comprising:

a guiding device capable of being held parallel to the surfacing,

a carriage displaceable over the length of the guiding device, a shoe on said carriage, said shoe being subjected to a vertical load,

dynamometric pick-up means capable of measuring the tangential friction of the shoe on the surfacing in the course of said displacement of said carriage, said shoe being fixed directly on said dynamometric pick-up means, which is mounted at the lower extremity of a loaded vertical spindle mounted slidably on said carriage,

driving assembly for moving said carriage at constant speed over the length of said guiding device, and

recorder means connected to the dynamometric pick-up means to record the variations of tangential friction of the shoe on the surfacing in the course of the displacement of said carriage.

4,081,990

HYDRAULIC PIPE TESTING APPARATUS

John C. Chatagnier, 704 Glendale Ave., Houma, La. 70360

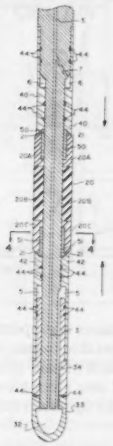
Filed Dec. 29, 1976, Ser. No. 755,266
Int. Cl.[2] G01M *3/28*; E21B *33/124*
U.S. Cl. 73—40.5 R **15 Claims**

1. A pipe testing apparatus, comprising:

a. an elongated body attachable to a source of pressurized hydraulic fluid, said body being insertable into the inner portion of a section of pipe to be tested;

b. a pair of seal means on said body for forming substantially fluid tight pressurized seals between said body and the walls of a pipe in which said testing apparatus is placed, each of said seal means being a flexible expandable section of said body and said flexible expandable section is compressed by the action of a pair of hydraulic pistons cooperatively connected to said flexible section, said pistons being slideable on said elongated body, and said pistons being simultaneously urged towards said flexible expandable section when pressurized fluid is conveyed to said pipe testing apparatus;

c. nozzle injector means on said body between said pair of seal means for introducing pressurized fluid into the space created between said pair of seal means when said seal means are activated by the introduction of pressurized fluid into said body, said nozzle injector means comprising a reduced orifice opening in said elongated body;



d. channel means in said body for simultaneously transmitting pressurized fluid to said nozzle injector means and to said pair of seal means; and

e. a plurality of fluid conduits providing a fluid connection between said channel means and each of said hydraulic pistons, the pressure of fluid within said channel means and each of said fluid conduits being substantially the same whereby each of said hydraulic pistons is urged to expand its respective flexible expandable section with substantially equal force.

4,081,991

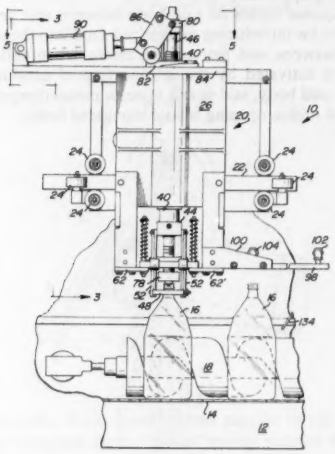
APPARATUS FOR PRESSURE TESTING FRANGIBLE CONTAINERS

Whitney S. Powers, Jr., Pine City, N.Y., assignor to Powers Manufacturing, Inc., Elmira, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,991
Int. Cl.[2] G01M *3/04*
U.S. Cl. 73—41 **10 Claims**

1. Apparatus for pressure testing frangible containers comprising a conveyor for moving containers along a horizontal path, a carriage guided for horizontal reciprocation parallel to said path, a vertically disposed pressure conduit supported by said carriage for horizontal reciprocation with said carriage, means on said carriage for causing movement of said conduit in a vertical direction while the carriage is moving horizontally, means including a pair of jaws supported by said carriage adjacent the lower end of said conduit for lifting a container off said conveyor and supporting the container during such horizontal reciprocation and for returning the container to said conveyor at the end of such horizontal reciprocation, means on said carriage for moving said jaws between open and closed positions as a function of the elevation of said jaws with respect to said conveyor with the jaws being open at the beginning and end of said reciprocatory movement of said carriage and with the jaws remaining open on the return stroke of said carriage, a head on the lower end of said conduit for sealing contact

with the open end of the container to be tested and for introducing a liquid under pressure from said conduit into a container to be tested while the container is supported from above by said jaws, a supply conduit connected to said pressure conduit for introducing the liquid under pressure thereinto



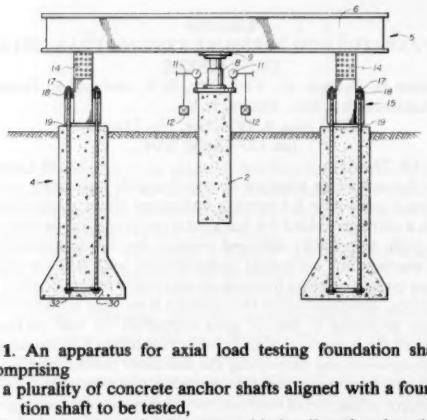
only while the container is supported from above by said jaws, and a selectively operable means on said carriage for preventing upward movement of said pressure conduit when a liquid is being introduced into a container by said pressure conduit, thereby opposing any upward reaction force from the pressurized liquid.

4,081,992

APPARATUS FOR LOAD TESTING FOUNDATION SHAFTS

Ravi P. Aurora, and Glyen D. Farmer, both of Houston, Tex., assignors to Farmer Foundation Company, Inc., Houston, Tex.

Filed Nov. 22, 1976, Ser. No. 743,851
Int. Cl.² G01N *33/24*
U.S. Cl. 73—84 **14 Claims**



1. An apparatus for axial load testing foundation shafts, comprising

a plurality of concrete anchor shafts aligned with a foundation shaft to be tested,

beam means spanning between said plurality of anchor shafts and over said foundation shaft,

means for applying an axial load between said beam means and said foundation shaft, and

a tie-down assembly formed within and substantially removable from the interior of each of said anchor shafts for transferring reaction forces from said means for applying an axial load to said anchor shafts, including

base means fixedly connected within said anchor shaft,

a plurality of tension members removably connected to said base means and extending upwardly through said anchor shaft, and

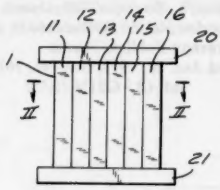
adaptor means for removably connecting said tension members to said beam means.

4,081,993

DEVICE FOR MEASURING THE MAGNITUDE AND DIRECTION OF COMPRESSION FORCES

Joachim Leonhardt, Essen, and Hans-Dieter Klein, Hattingen (Ruhr), both of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed Apr. 27, 1977, Ser. No. 791,599
Claims priority, application Germany, Apr. 28, 1976, 2618538
Int. Cl.² G01N *3/08*
U.S. Cl. 73—88 R **16 Claims**



1. A device for measuring compression forces, preferably compression forces acting on supports in an underground mine gallery, comprising a pair of spaced substantially parallel abutment members adapted to be subjected on faces thereof directed away from each other to opposite compression forces to be measured; and a pressure body composed of a plurality of elongated parts of relatively brittle material and having respectively different resistance against compression forces, said parts being arranged closely adjacent to each other between said abutment members and extending in longitudinal direction substantially normal thereto to be subjected to the compression forces acting on said abutment members, whereby said parts of said pressure body will be deformed to a different degree, indicating thereby the magnitude of the compression forces.

4,081,994

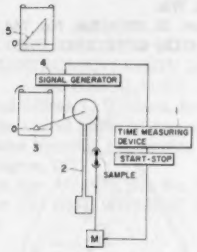
METHOD OF TENSION STRESS TESTING OF RUBBER

Takeshi Yamawaki, Hiratsuka; Tokitaro Hoshijima, Yokohama, and Kiyoshi Mizushima, Atsugi, all of Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1976, Ser. No. 733,867
Claims priority, application Japan, Oct. 20, 1975, 50-126187
Int. Cl.² G01N *3/08*
U.S. Cl. 73—95 **1 Claim**

1. A method of tension stress testing of rubber of the type wherein a rubber sample having a predetermined shape is elongated continuously at a predetermined speed, and the tension stress is measured when the distance between a pair of reference positions set on the surface of the sample shows a predetermined elongation, wherein (1) prior to the actual test, a plurality of rubber samples having said predetermined shape and different hardness are elongated continuously under predetermined tension test conditions, the tension stress measuring time between the time of commencing said continuous elongation and a time at which said distance between said reference positions is measured, and by utilizing the data thus obtained and the data regarding the hardness of respective rubber samples, the measuring time function of the tension stress measuring time with regard to hardness is determined by a statistical

method, and (2) in the actual test, the hardness of a rubber sample is measured, the tension stress measuring time is determined from the measured value of hardness in accordance with



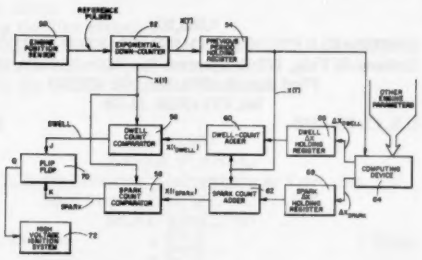
the measuring time function, then the rubber sample is elongated continuously under said tension test conditions, and the stress is measured at said tension stress measuring time to determine the tension stress.

4,081,995

APPARATUS AND METHOD FOR EXTRAPOLATING THE ANGULAR POSITION OF A ROTATING BODY

Glen R. Griffith, Westminster; Zane A. Sandusky, Orange, and George A. Watson, Tustin, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 22, 1977, Ser. No. 771,056
Int. Cl.[2] F02P *5/08*
U.S. Cl. 73—116 **8 Claims**



1. In a timing control system having a sensor device that provides a reference pulse at least once during each period of rotation of a rotatable member to indicate that the rotatable member is at a known angular position, a clock source for generating a periodic clockpulse signal, a counter responsive to the clock source for producing a pulse-count signal the value of which is a function of the number of clock-pulses generated, a computing device for receiving a plurality of signals that indicate a corresponding plurality of parameters for computing a count corresponding to a desired angular position of the rotatable member and for generating a signal representative of the desired angle count, and a comparator for receiving the pulse-count signal and the desired angle count signal and for producing a function initiating signal when the pulse-count signal and the desired angle count signal are equal; an improved position extrapolation device comprising:

means in said counter for generating a count signal that is a non-linear function of time and for resetting said counter to a known starting count at each occurrence of said reference pulse,

means for sequentially storing the final non-linear count signal to occur immediately prior to each said resetting, and

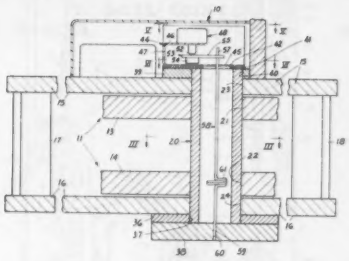
means in said computing device responsive to said storing means and to said parameter indicating signals for computing and generating a signal representing the non-linear count corresponding to a subsequent desired angular position for producing a function signal, whereby a function signal is produced at a desired angular position that is based upon a non-linear extrapolation of a known angular position.

4,081,996

FORCE-MEASURING DEVICES

Marvin D. Jennings, Naperville, and Rolf E. Schmidgall, Hinsdale, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 2, 1977, Ser. No. 765,011
Int. Cl.[2] G01L *1/04*
U.S. Cl. 73—141 A **19 Claims**



1. A device for measuring the force transmitted between two members comprising:

a force-transmitting element of resiliently deformable material and of generally C-shaped cross-sectional configuration having inner and outer generally cylindrical and concentric surfaces and an axially extending slot defined by facing angularly spaced surfaces, said members being engageable with said outer cylindrical surface at diametrically opposite portions of said element lying along a diametrical plane generally transverse to a radial plane through said slot to move said diametrically opposite portions toward each other and to move said slot surfaces toward each other in proportion to the force transmitted between said members by said element;

displacement measuring means including a movable contact element for measuring the displacement of one of said diametrically opposite portions of said element toward the other;

lever means;

means supporting said lever means for pivotal movement about an axis in substantially fixed relation to said other of said diametrically opposite portions and in a plane generally transverse to said diametrical plane through said diametrically opposite portions;

first coupling means coupling said one of said diametrically opposite portions to said lever means at a point spaced a first predetermined distance from said axis; and

second coupling means coupling said movable contact element to said lever means at a point spaced a second predetermined distance from said axis, said second predetermined distance being substantially greater than said first predetermined distance.

4,081,997

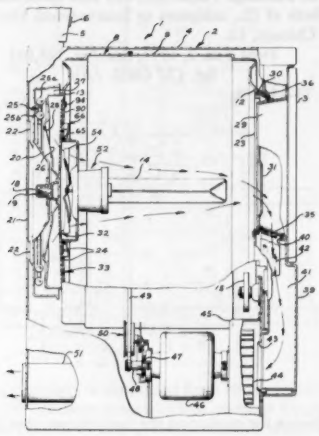
CLOTHES DRYER AIR FLOW TEST DEVICE AND METHOD

Gerhard K. Losert, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 23, 1977, Ser. No. 771,408
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—168 **8 Claims**

1. In a device for checking the adequacy of the rate of air

flow in a rotating clothes dryer drum having air flow through a first centrally disposed set of perforations and a second set of perforations radially outward of the first set in the rear wall of the drum, including a rotatable fan, a counter assembly arranged and including means to register the number of revolutions of the fan, and means to removably attach the device to the rear wall of the drum over the first set of perforations, the improvement comprising:



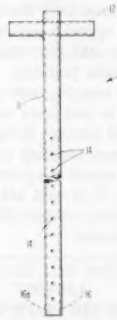
a flexible circular skirt having a central opening and means to removably attach the skirt to the rear wall of the drum over the second set of perforations to block air flow therethrough whereby air flowing through the rear wall of the drum is caused to go through the central opening and the fan.

4,081,998

FLOW STILLING DEVICE

Kenneth W. Martig, Jr., Olympia, Wash., assignor to Pro-Tech, Inc., Paoli, Pa.

Filed Jun. 8, 1977, Ser. No. 804,542
Int. Cl.[2] G01F *23/14*
U.S. Cl. 73—302 12 Claims



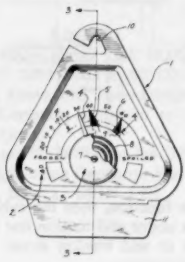
1. Stilling device for use in an open water or sewer pipe or conduit, comprising a T-shaped structure having a cross-bar and having also an open-ended tubular base leg affixed to and extending from the cross-bar a distance exceeding the vertical inside dimension of the pipe or conduit.

4,081,999

TEMPERATURE INDICATOR WITH LIMIT DETECTION APPARATUS

Thomas J. Lenken, Milwaukee, Wis., assignor to Desco Corporation, Milwaukee, Wis.

Filed Nov. 26, 1976, Ser. No. 744,959
Int. Cl.[2] G01K *3/00, 5/62*
U.S. Cl. 73—343 R 13 Claims



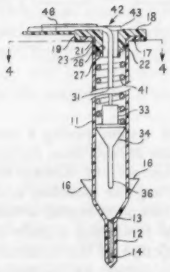
1. A temperature limit indicating apparatus, comprising a temperature sensitive assembly including a moveable indicator element, a support unit for said assembly including a member aligned with and laterally spaced from the path of said moveable element, said assembly including means supporting said moveable indicator element for lateral movement with respect to said member, and an inclined latching wall means secured to the member and projecting outwardly into the path of said element and forming an offset latching means preventing reverse movement of the indicator element.

4,082,000

DISPOSABLE COOKING THERMOMETER STRUCTURE

Anthony J. Volk, 173 E. Syracuse St., Turlock, Calif. 95380

Filed Apr. 9, 1976, Ser. No. 675,290
Int. Cl.[2] G01K *11/06*
U.S. Cl. 73—358 1 Claim



1. In a disposable cooking thermometer having a hollow barrel with a resiliently flexible indicator stem spring loaded therein to move an outer end of the stem into the barrel as a material engaged by the stem in a closed end of the barrel softens at a predetermined temperature, an improved latch and barrel closure structure including a flange about a rear open end of said barrel and an integral prong centrally of the stem and pivotable outward of the stem as the latter is bent at a reduced cross section portion thereof to engage a closure member having an aperture aligned with the barrel opening and an indentation on an under side thereof and engaging said barrel flange in tight fitting relation therein with said closure member having a cutout spelling LIFT STEM therethrough above said barrel flange, and a lateral extension extending laterally outward of the barrel beneath the bent stem with ridges on said closure member alongside the stem is bent and

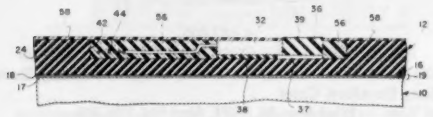
latched position thereof with said lateral extension being of sufficient length to underly all of said stem that is bent over in latched position.

4,082,001

NON-DESTRUCTIVE METHOD FOR APPLYING AND REMOVING INSTRUMENTATION ON HELICOPTER ROTOR BLADES

Walt C. Long, and Milton L. Williams, both of Hampton, Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 19, 1977, Ser. No. 788,705
Int. Cl.[2] G01L *9/00*; B64C *27/46*
U.S. Cl. 73—756 **12 Claims**



1. A method for applying removable instrumentation to an airfoil while maintaining essentially the same aerodynamic characteristic of the airfoil comprising the steps of:

preparing the area of the airfoil that is to be instrumented;

applying a protective substrate of adhesive dissolvable in methylethylketone to the top, bottom and leading edge of the airfoil;

positioning and bonding balance weights to the leading edge of the airfoil;

bonding filler material to the top, bottom and leading edge of the airfoil;

fairing the filler material;

bonding instrumentation to the airfoil and filler material; and

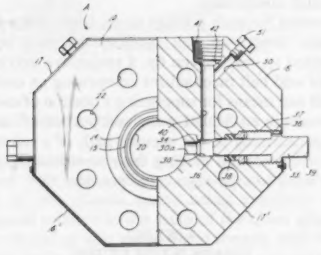
applying a coat of epoxy resin-saturated glass fiber cloth over the surface of the instrumentation.

4,082,002

GAUGE FLANGE

Benton F. Baugh, Houston, Tex., assignor to Vetco, Inc.

Filed Mar. 7, 1977, Ser. No. 774,852
Int. Cl.[2] G01L *7/00*
U.S. Cl. 73—756 **1 Claim**



1. A gauge flange for mounting a pressure gauge in a pipeline or pressure vessel, comprising:

a body having substantially parallel plane sides and having a central bore therein;

means for connecting said flange to a pressure vessel or line;

valve passage in said flange body communicating said central bore;

valve seat in said valve passage;

valve stem in said valve passage and adapted to be moved into and out of engagement with said valve seat to close and open communications through said valve passage;

pressure gauge passage in said flange body communicating with said valve passage for connecting a pressure gauge thereto; and

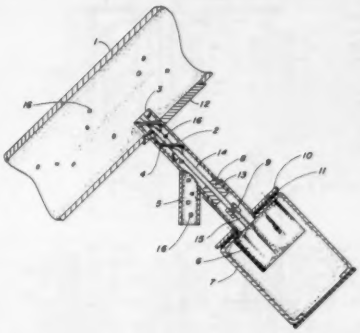
lubricant passage in the flange body communicating with said pressure gauge passage for injecting a lubricant into said pressure gauge passage to exclude the working fluid therefrom.

4,082,003

PELLET SAMPLER AND METHOD OF SAMPLING PELLETS

Robert Carl Hentschel, Jr., and William McIntosh Gignilliat, both of Columbia, S.C., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Feb. 24, 1977, Ser. No. 771,710
Int. Cl.[2] G01N *1/20*
U.S. Cl. 73—422 R **10 Claims**



1. In a pellet sampling apparatus comprising an opening in a conduit exposed to flowing pellets, said opening communicating with an auger which revolves to remove a portion of said pellets as a sample, the improvement comprising

said opening being fixed and having a plane at an angle including and between parallel and normal to the flow of said pellets and normal to the axis of the drive shaft of said auger,

said opening coinciding with the feed end of said auger,

said auger revolving at a measured rate to meter said pellets through said opening,

said flowing pellets having a periphery, and said opening being located near the periphery of said flowing pellets, providing minimum obstruction to flow of flowing pellets to avoid causing an accumulation of pellets around the sampler,

whereby said pellets collected at said metered rate so that a representative, uniform sample is collected.

4,082,004

CROSSCUT SAMPLER

Joseph A. Weber, Arlington, Tex., and Hugo Wenshau, Burnsville, Minn., assignors to Gustafson, Inc., Hopkins, Minn.

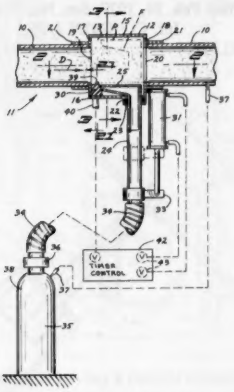
Filed Apr. 14, 1977, Ser. No. 787,370
Int. Cl.[2] G01N *1/20*
U.S. Cl. 73—422 R **14 Claims**

1. Apparatus for drawing a representative sample of granular or particulate material flowing in a conveying pipe of a pneumatic conveying system, comprising

a sealed housing with aligned entrance and exit flow openings for connection into the conveying pipe, the housing having an open interior with an unobstructed central passage aligned with the flow openings to permit free flow of the material-laden air moving through the pipe, the housing also having open interior side spaces adjacent the central passage,

means collecting samples of the material flowing through

the central passage of the housing and including a sample collecting head in the housing and movable therein to and between said side spaces and in a first direction transversely of the central passage and entirely through said central passage, the head having a front face oriented to confront the entrance opening of the housing and also oriented at an oblique angle with respect to said first direction, the head also having an elongate entrance in said front face to permit access of such flowing material into the sample collecting head, said entrance extending entirely across the central passage in a direction transversely of said first direction,



an elongate mounting slide carrying said collecting head and also extending transversely outwardly through one side of the housing and being slidably mounted thereon, and

a closure mounted in one of said side spaces of the housing and having a sealing surface to abut and seal against the front face of the sample collecting head to entirely close the entrance to the head when the head is moved out of the flow passage, the sealing surface of said closure also being oriented obliquely of said first direction and lying along and in the direction of said front face to lie flush against the front face of the head.

4,082,005

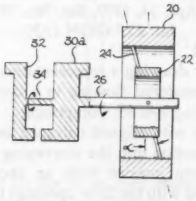
SPIN COUPLED, ANGULAR RATE SENSITIVE INERTIAL SENSORS WITH MOUNTING STRUCTURE AND METHOD OF FABRICATING AND MOUNTING SAME

Harold F. Erdley, Los Angeles, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 608,770, Aug. 25, 1975, Pat. No. 3,974,701. This application Feb. 8, 1976, Ser. No. 710,693

Int. Cl.² G01C *19/22, 19/42*

U.S. Cl. 73—505 **33 Claims**



1. A tuned inertial instrument comprising:

an instrument case;

a shaft means supported on bearings coupled to said instrument case for rotation about a spin axis at a predetermined spin frequency within said instrument case;

a sensitive element;

a suspension means for coupling said sensitive element to said shaft, said suspension means including means for allowing relative oscillation between said sensitive element and said shaft about at least one suspension means axis, said suspension means axis being non-orthogonally disposed with respect to said spin axis by a predetermined angle;

means coupled to said shaft for providing a product of inertia about said spin axis and an axis perpendicular to said spin axis; and

means for reducing the apparent angular restraint of the nonrotating portion of said bearings about axes generally perpendicular to said spin axis.

4,082,006

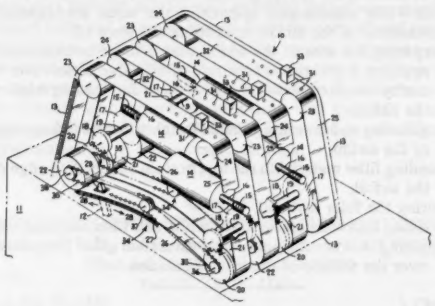
POSTAGE METER CONVERSION APPARATUS

Keith E. Schubert, Rowayton, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sep. 30, 1976, Ser. No. 728,302

Int. Cl.² F16H *27/02*

U.S. Cl. 74—89.2 **7 Claims**



1. A postage meter conversion apparatus for converting a lever settable mechanical postage meter into an electrically controlled postage meter, said postage meter having a number of banks, each bank having a lever movable in an arcuate path to set a postage value for said bank, the postage meter conversion apparatus comprising:

a drive motor for each postage meter bank; and a number of movably supported belt mechanisms each operatively connected to, and driven by, a respective driving motor, each of said belt mechanisms comprising an endless flexible belt and means for supporting a portion of each belt for movement in an arcuate path, said portion of each of said belts conforming to the arcuate path of a corresponding lever, each portion driving the corresponding lever of a meter bank to a postage value position.

4,082,007

CHAIN WITH GUIDE

Robert V. Strickland, 9021 Wedd, Overland Park, Kans. 66212

Filed Jun. 11, 1976, Ser. No. 695,183

Int. Cl.² F16H *7/18*

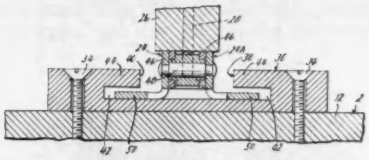
U.S. Cl. 74—240 **2 Claims**

1. In combination with an endless flexible sprocket chain trained about two or more sprocket wheels and driven linearly by said sprocket wheels, said chain having a normally straight reach between a pair of consecutive sprocket wheels to which is affixed a member extending laterally from said chain, a guiding device operable to insure that the extended end of said extending member may be accurately indexed to the linear position of said chain, said guiding device comprising:

a. a fixed, straight guide member extending along said

straight chain reach in parallel closely spaced relation thereto, the surface of said guide member confronting said chain being disposed transversely to the plane of the loop formed by said chain, whereby transverse deflection of said straight chain reach in the plane of the chain loop, toward said guide member, is prevented,

b. means interconnecting a section of said chain, including the point thereof to which said extending member is affixed, to said guide member, said interconnecting means being operable to permit longitudinal sliding movement of said chain relative to said guide member, but to prevent



movement of said chain reach transversely of itself in a direction away from said guide member, and also to prevent canting or cocking of the portion of the chain to which said extending member is affixed, both in the plane of said chain loop and also in a direction transverse to the plane of said chain loop, projecting to a substantial distance laterally from said straight chain reach, and

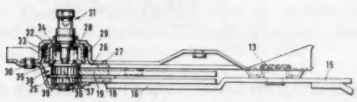
c. a second fixed guide member spaced substantially apart from said straight chain reach and having a slot formed therein parallel to said straight chain reach, said extending member projecting through and being disposed for longitudinal sliding movement in said slot.

4,082,008

POSITIONING MECHANISM FOR AUTOMOTIVE SEAT, WINDOW OR SIMILAR PART

Bernd Klüting, Radevormwald, Germany, assignor to Keiper KG, Remscheid-Hasten, Germany

Filed Sep. 29, 1976, Ser. No. 728,012
Claims priority, application Germany, Oct. 3, 1975, 2544174
Int. Cl.² G05G *5/06*
U.S. Cl. 74—531 **7 Claims**



1. A positioning mechanism comprising:

a support;

a pinion rotatable on said support about a pinion axis and formed with two axially spaced arrays of gear teeth, the teeth of one of said arrays being angularly offset and staggered relative to the teeth of the other array; and

a lever pivotal on said support and formed with two axially spaced racks, one meshing with said one array and the other meshing with said other array.

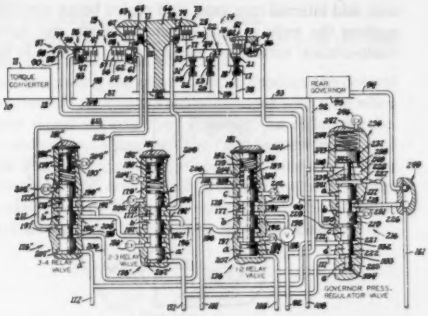
4,082,009

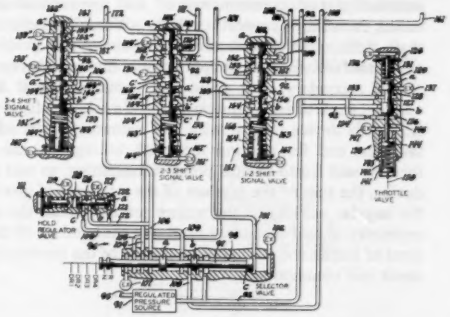
RANGE SHIFT CONTROL BY INPUT GOVERNOR

Carl A. Lentz, Mooresville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1976, Ser. No. 750,129
Int. Cl.² F16H *47/00*
U.S. Cl. 74—731 **6 Claims**

1. In a transmission: an input; an output; a gear unit connecting said input and output having gear unit control means including a plurality of ratio establishing means selectively actuated to provide a low ratio drive and a high ratio drive; a source of regulated pressure fluid; an input governor connected to said input providing an input governor pressure proportional to input speed and increasing in said low ratio drive in a higher proportion to output speed than in said high ratio drive; shift valve means operatively connected to said source and said gear unit control means and having an actuator and operative to establish said low ratio drive, and in response to a higher governor pressure in said actuator to automatically shift to establish said high ratio drive; speed pressure control means operatively connected to said input governor and said





shift valve means operative when said shift valve means provides a drive and in response to input governor pressure to regulate modified input governor pressure at values in said low ratio drive proportionately reduced relative to input governor pressure to reduced values increasing in a reduced proportion to output speed to said higher governor pressure and in said high ratio drive to provide said input governor pressure in said high ratio drive up to a limit value and then modified input governor pressure regulated at values proportionately reduced in said reduced proportion and increased in a constant proportion to provide modified input governor pressure similarly varying with output speed in said low and high ratio drives.

4,082,010

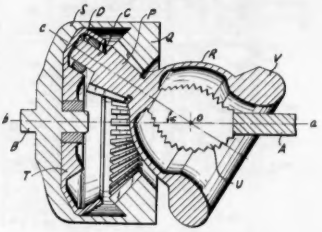
DEVICE FOR ROTATIONAL TRANSMISSION OF MECHANICAL POWER DEPENDING ON AN ANGULAR SPEED SELECTOR WHICH FUNCTIONS AS A RESULT OF THE RESISTANCE WHICH IT MEETS

Pierre Gantier, 8 rue des Oiseaux, 37000 Tour, France

Continuation of Ser. No. 450,835, Mar. 13, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,541
Int. Cl.² F16H *1/28*
U.S. Cl. 74—800 **8 Claims**

1. A power transmission, for equilibrium of forces transmitted by precession of a gyroscope rotor, comprising, in combination, a rotatable drive guide shaft rotatable with the gyroscope rotor; a rotatable driven receiver shaft coaxial with said

drive guide shaft; said drive guide shaft and said driven receiver shaft having facing ends spaced axially from each other; a rotatable secondary shaft extending at an angle to the common axis of said drive guide shaft and said driven receiver shaft; a universal joint interconnecting the facing end of said drive guide shaft to a first end of said secondary shaft, and having a geometrical center; the axes of symmetry of said guide shaft, said driven receiver shaft and said secondary shaft intersecting at said geometrical center; a frusto-conical internal ring gear rotatable with said driven receiver shaft; a frusto-conical pinion rotatable with said secondary shaft and meshing with said internal ring gear, said pinion being positioned intermediate the ends of said secondary shaft; the apices of the frusto-conical surfaces of said internal ring gear in said pinion



intersecting said common axis at said geometrical center; means, including a support rotatable with said driven receiver shaft, defining an annular channel receiving and guiding the end of said secondary shaft opposite said first end for revolving of said secondary shaft about said common axis at a fixed constant angle to said common axis; and a rotationally symmetric inertia device coaxial with said secondary shaft adjacent said first end for rotating therewith to regulate the speed thereof; said frusto-conical pinion transmitting, to said inertia device, the sum of the product of the moments of inertia and the angular velocity of the masses rotating about the axis of symmetry of said secondary shaft and the product of the moment of inertia and the angular velocity of the masses rotating about said common axis.

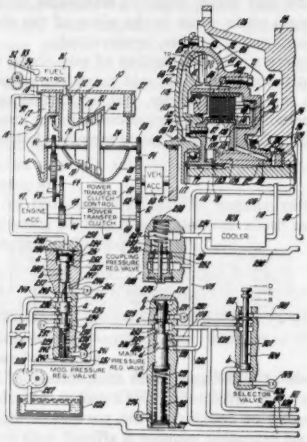
4,082,011

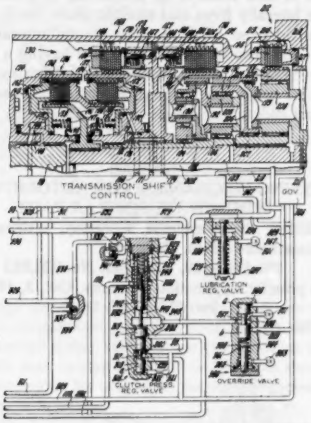
ENGINE AND TRANSMISSION POWER TRAIN

Ted M. McQuinn, Carmel, and Richard B. Anderson, Indianpolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 448,991, Mar. 7, 1974, Pat. No. 4,018,316. This application Dec. 17, 1976, Ser. No. 751,701
Int. Cl.[2] B60K *41/04*; F16H *39/00*
U.S. Cl. 74—862 **14 Claims**

1. In a transmission for use with an engine providing a net available output torque; fuel feed means movable from idle to full fuel feed including means providing a torque demand signal, a transmission having an input member and a load member, ratio gear means having ratio control means to selectively establish a starting drive ratio connected to drive said load means, a fluid coupling and a variable capacity slipping friction clutch connected in parallel between said input member and ratio gear means, said fluid coupling being operated at stall on engagement of the starting drive ratio and having a predetermined stall torque capacity to provide coupling torque equal to and increasing relative to the net available engine torque at a low functional idle speed for proper accessory drive and a starting drive to automatically regulate engine speed at said low idle speed at idle fuel feed and operative to provide a small gradual increase of torque at stall during fuel feed advance from idle in a low fuel feed range, clutch control means responsive to said torque demand signal to maintain said clutch substantially disengaged in said low fuel feed range and to gradually increase clutch torque capacity to maximum engine torque capacity to provide a slipping clutch drive gradually increasing the clutch torque to clutch lock up and to maximum torque capacity in a higher fuel feed range.





4,082,012

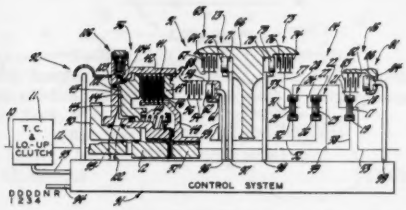
TRANSMISSION AND CONTROL WITH CENTRIFUGAL DUMP VALVE

Robert H. Schaefer, Westfield, and Ted M. McQuinn, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1977, Ser. No. 760,226
Int. Cl.[2] B60K *41/04*
U.S. Cl. 74—864 **5 Claims**

1. In a transmission: a multiratio gear unit having an input rotating in an input drive rated speed range and an output drive higher speed range, an output and a plurality of drive devices including a forward drive device selectively operated to establish forward drives and reverses drive; a source of regulated fluid pressure; control means connected to said source and operatively connected to said drive devices operative in a forward drive position to control the supply of fluid from said source to said drive devices including said forward drive device to selectively establish said forward drives, operative in reverse drive position to control the supply of fluid from said

source to said drive devices to establish said reverse drive; and operative in neutral position to control the supply of fluid from said source to said drive devices to provide neutral dump valve means operatively connected to said forward drive device and having a valve element operative in one position to disengage said forward drive device and in another position to permit engagement of said forward drive device and having total biasing means biasing said valve element with a total bias force to said another position including first biasing means providing a first bias force decreasing with increasing input speed and second biasing means providing a second bias force increasing with increasing input speed, and said valve element being responsive to a centrifugal bias force providing a centrifugal bias force increasing with input speed to bias said valve element to said one position and operative in said foward drive position of said control means in response to said total bias force overcoming said centrifugal bias force to move said valve element to said another position to maintain establishment of any selected one of said forward drives throughout said input drive rated speed range and to move said valve element to said one position to disestablish any selected one of said forward drives at and above a predetermined output drive speed in said output drive higher speed range and operative in another position of said control means to disestablish said second bias force and to move said valve element to said one position in response to said centrifugal bias force overcoming said first bias force at a predetermined low input speed in said input drive rated speed range to flush said small residual amount of fluid through said dump valve means.



4,082,013

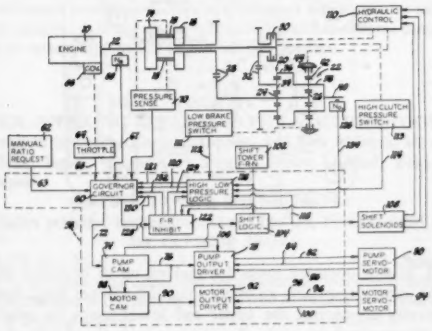
HYDROSTATIC TRANSMISSION CONTROL

Kenneth A. Dornfeld, Indianapolis; Jerry R. Marlow, Greenwood, and Robert K. Sanders, Lebanon, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1974, Ser. No. 526,379

Int. Cl.[2] B60K *41/18*; F16H *37/00*; F16D *39/00*

U.S. Cl. 74—866 **9 Claims**



1. A control for a variable ratio hydrostatic transmission wherein the transmission responds rapidly and directly to a control signal derived independently of transmission output to provide a transmission ratio corresponding to the magnitude of the control signal comprising,

means for providing a ratio request signal,

means for comparing the ratio request signal with the control signal to produce an error signal, and

means for integrating the error signal to produce the control signal whereby the control signal changes with time when an error signal is present to diminish the difference between the control signal and the ratio request signal.

2. A control for a variable ratio hydrostatic transmission wherein the transmission ratio responds to a control signal comprising,

means for providing a ratio request signal,

means for comparing the ratio request signal with the control signal to produce an error signal,

means for integrating the error signal to produce the control signal whereby the control signal changes with time when an error signal is present to diminish the difference between the control signal and the ratio request signal, and

means for limiting the maximum absolute value of the error signal whereby the rate of change of the control signal and hence the rate of change of the transmission ratio is limited to a maximum value to insure smooth ratio changes.

4,082,014

WHEELHEAD

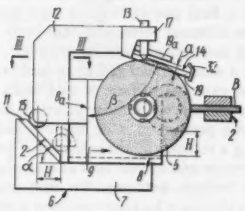
Vladimir Viktorovich Idel, Mukachevsky raion, selo Kolchino ulitsa Kirova, 11, Zakarpatskaya oblast, U.S.S.R.

Filed Apr. 6, 1977, Ser. No. 785,223

Claims priority, application U.S.S.R., Jul. 23, 1976, 2377403; Oct. 19, 1976, 2408301

Int. Cl.[2] B23D *63/12*; B24B *53/12*

U.S. Cl. 76—43 **9 Claims**

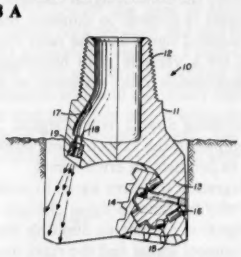


1. A wheelhead in a grinding machine for sharpening the teeth of band saws, comprising: a base; horizontal guideways made on said base; a support mounted in said guideways; a grinding wheel mounted on said support and serving for sharpening the teeth of a band saw; a flat portion on said base on the side thereof opposite to the saw-teeth sharpening area, said flat portion being inclined at 45° to the horizontal; a holder movably mounted on said support and bearing on said flat portion which serves as a guide for displacement of said holder; a dressing tool to dress said grinding wheel, said dressing tool being mounted in said holder; a device for holding the saw in the course of grinding off its weld, said device being mounted in said holder in the area of location of the dressing tool and having at least three supporting elements, of which two lower supporting elements are spaced apart at a distance sufficient for the passage of said grinding wheel therebetween, and the third supporting element is disposed in close proximity to said grinding wheel above said lower supporting elements, parallel thereto and at a distance therefrom substantially equal to the saw thickness, all said supporting elements being arranged at an angle equal or close to 90° to the vertical so that the saw blade held therebetween in the course of grinding off its weld is disposed at a tangent to said grinding wheel.

4,082,015
REMOVABLE DRILL BIT NOZZLE

Paul George Craig, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 654,148, Jan. 30, 1976, Pat. No. 4,019,593.
This application Jan. 26, 1977, Ser. No. 762,687
Int. Cl.[2] B21K 5/02
U.S. Cl. 76—108 A 1 Claim



1. A method of securing and replacing a nozzle in a rotary rock bit, said rock bit having a body with cutter means mounted thereon, a fluid passage for discharging drilling fluid downwardly from the body, and a nozzle of erosion resistant material adapted to fit within said fluid passage for discharging drilling fluid, comprising the steps of:

providing a first annular groove extending around said nozzle;

providing a second annular groove in said body located in said fluid passage adapted to register with the first annular groove extending around said nozzle;

positioning said nozzle in said fluid passage with said first annular groove registering with said second annular groove, said first annular groove and said second annular groove substantially lying in a common plane;

providing a first passageway in said body which extends from the external surface of said body into register with said first and second annular grooves;

providing a second passageway in said body which extends from the external surface of said body into register with said first and second annular grooves, said second passageway being positioned at an angle to said common plane;

positioning a retainer member in one of said first and second passageways and in said first and second annular grooves until it bridges between the first and second annular grooves to form a locking structure which prevents movement of the nozzle within said fluid passage;

forcing a removal element into the other of said first and second passageways and into said first and second annular grooves until it comes into contact with said retainer member; and

driving said retainer member from said first and second annular grooves and allowing said nozzle to be removed from said fluid passage.

4,082,016
LID REMOVER

Joseph S. Vonusa, 47 Somersett Dr., Mystic, Conn. 06355

Filed Apr. 11, 1977, Ser. No. 786,450
Int. Cl.[2] B67B 7/22
U.S. Cl. 81—3.43 3 Claims

1. Apparatus for removing from a container a lid having an axis of rotation comprising:

first and second operating members each including juxtaposed handle elements at one end thereof having first opposed surfaces and associated jaw elements at the other end thereof having second opposed surfaces generally diverging in a direction away from said handle elements;

pivot means joining said first and second operating members intermediate their ends permitting relative rotation thereof between an open position at which said handle elements are spaced apart and a closed position at which said handle elements are in a substantially contiguous relationship;

a substantially flat rigid plate fixed to one of said operating members and lying in a plane parallel to and proximate with a plane containing said jaw elements, said plate being engageable with an upper surface of the lid to be removed for positioning said jaw elements so that they lie in the plane of the lid; and

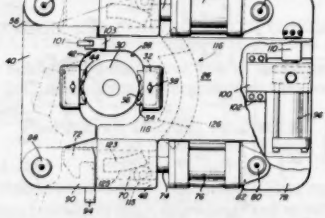
an elongated resilient element fixed at one end to one of said operating members and forming a loop in a region defined between said jaw elements and having a free end extending between said handle elements, said loop adapted to

encircle the outer peripheral surface of the lid, such that as the free end of said resilient element is drawn between said handle elements in a direction away from the container lid, the loop engages the outer peripheral surface of the container lid and draws the lid firmly against said resilient element proximate to said opposed surfaces whereby relative rotary displacement of said handle elements from said open position to said closed position draws said first opposed surfaces into engagement with said element and subsequent rotation of said handle elements as a unit in a direction about the axis of rotation of the container lid results in loosening and removal of the lid from the container.

4,082,017
POWER OPERATED DRILL PIPE TONGS

Emery Eckel, Odessa, Tex., assignor to Eckel Manufacturing Co., Odessa, Tex.

Continuation-in-part of Ser. No. 539,078, Jan. 7, 1975, abandoned. This application Sep. 30, 1976, Ser. No. 728,062
Int. Cl.[2] B25B 17/00
U.S. Cl. 81—57.16 36 Claims



1. Power operated tongs for making up or breaking apart pipe joints comprising an upper tong and a lower tong, means swivelly connecting the upper and lower tongs for relative angular movement, each of said tongs including a pair of opposed gripping jaws disposed in facing relation for gripping engagement with an upper and lower drill pipe joint, respectively, and power operated means interconnecting the upper

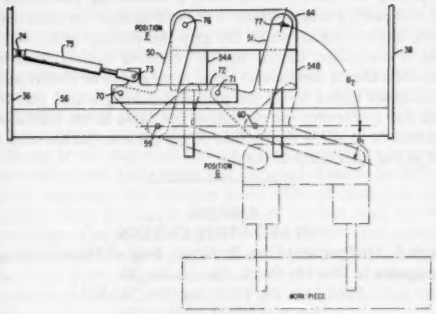
and lower tongs for swivelling the tongs in relation to each other over a limited displacement angle whereby the drill pipe joints may be made up or broken apart, one of the gripping jaws on each of the tongs being supported on a movable door, the opposed gripping jaw on each tong being mounted on a tong body, first means interconnecting the tong body and each end of the door to simultaneously move both ends of the door toward and away from the tong body in parallel relation to the tong body wherein each end of the door remains equidistant from the tong body for enlarging the distance between the jaws to enable the pipe joints to be moved through the tongs without disassembly of the tongs from the pipe, and second means for opening and pivoting said movable door to an open position to enable the pipe joints to be moved through the open door and placed into position between the gripping jaws or removed therefrom.

4,082,018

MACHINE TOOL AUTOMATION

John X. Russell, Troy, and Kenneth T. Liske, Sterling Heights, both of Mich., assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,804
Int. Cl.[2] B23B *13/00*; B23Q *5/22*
U.S. Cl. 82—2.5 **13 Claims**



1. In machine tool automation, a put-and-take module for putting a workpiece into and taking a workpiece from the machining position of the machine tool, comprising in combination, a linkage system defining in outline a parallelogram having a pair of spaced apart levers pivotally mounted on a fixed member and a cross member pivotally supported by and maintaining said levers in parallel relationship for supporting a workpiece parallel to the machining position, and a servomotor connected to said linkage system for rotating said levers in one direction from a neutral position wherein said levers are substantially in line with said fixed member through an angle to an extended position wherein a workpiece supported by said cross member is in the machining position and in reverse direction to return said levers to the neutral position.

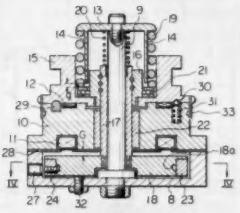
4,082,019

TOOL-INDEXING APPARATUS FOR MACHINE TOOL

Hiromichi Shichida; Kenichi Toyoda, and Jiro Nakano, all of Hino, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jan. 19, 1977, Ser. No. 760,713
Claims priority, application Japan, Jan. 23, 1976, 51-5826
Int. Cl.[2] B23B *29/32*
U.S. Cl. 82—36 A **5 Claims**

1. A tool-indexing apparatus for a machine tool comprising:
a first means being moved along a first direction by means of a driving source;
a tool-holding means being screw-engaged to said first means, and;
a stop means for restricting the movement of said tool-holding means along the first direction; wherein at the time when said movement of said first means takes place along said first direction, said tool-holding means together with said first means are moved along said first direction until said movement of said tool-holding means along said first direction is restricted by means of said stop means, and



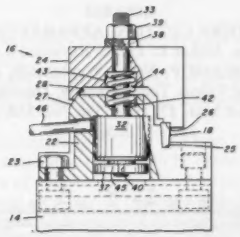
wherein after the time when said movement of said tool-holding means along said first direction is restricted by means of said stop means, said tool-holding means is forced to turn with said the movement of said first means in said first direction.

4,082,020

TOOL-CLAMPING DEVICE AND METHOD OF SETTING UP A PIPE CUTOFF MACHINE

Merle R. Stein, Duquesne, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1977, Ser. No. 761,180
Int. Cl.[2] B23B *29/00, 3/00, 1/00, 3/04*
U.S. Cl. 82—37 **7 Claims**



1. A tool-clamping device comprising a base, a cooperating cap, means attaching said cap to said base with said cap overlying said base, one of said base and cap having a tool-receiving notch and the other having cooperating surfaces for abutting two surfaces of a parting tool received in said notch, spring means urging said cap away from said base to a tool-releasing position, and hydraulic means for pulling said cap toward said base to a tool-clamping position against the action of said spring means, said base and said cap having slidably abutting inclined thrust surfaces to provide a wedge action for clamping said tool.

4,082,021

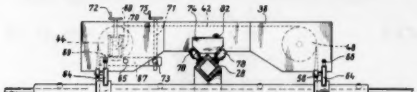
HORIZONTAL SPLITTING APPARATUS

Rolf Jung, Waiblingen, Germany, assignor to Krauss u. Reichert, Spezialmaschinenfabrik GmbH & Co., Fellbach, Germany

Filed Sep. 28, 1976, Ser. No. 727,439
Claims priority, application Germany, Oct. 2, 1975, 2543990
Int. Cl.[2] B26D *1/46, 4/00*
U.S. Cl. 83—4 **12 Claims**

1. Horizontal splitting apparatus comprising a work piece support, two cutting flights each having a cutting means and both being provided by at least one cutting member forming an

endless loop, and drive means for displacing the work piece support and the cutting flights to and fro relative to one another, said cutting flights extending over the work piece support in a substantially horizontal and transverse direction in



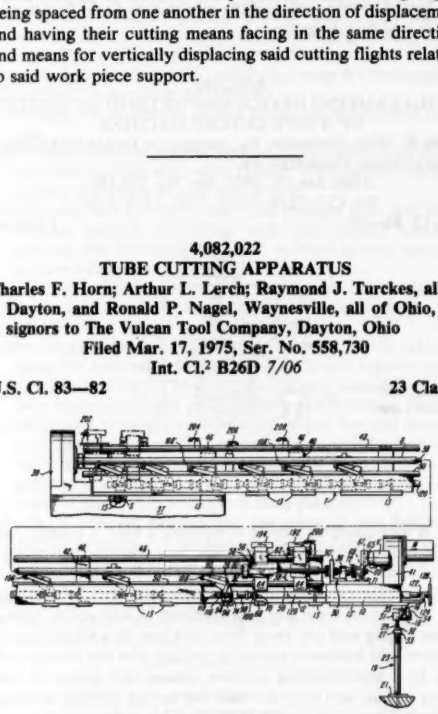
relation to the direction of displacement, said cutting flights being spaced from one another in the direction of displacement and having their cutting means facing in the same direction, and means for vertically displacing said cutting flights relative to said work piece support.

4,082,022

TUBE CUTTING APPARATUS

Charles F. Horn; Arthur L. Lerch; Raymond J. Turckes, all of Dayton, and Ronald P. Nagel, Waynesville, all of Ohio, assignors to The Vulcan Tool Company, Dayton, Ohio

Filed Mar. 17, 1975, Ser. No. 558,730
Int. Cl.[2] B26D *7/06*
U.S. Cl. 83—82 **23 Claims**



1. Tube cutting apparatus comprising a shearing head, a table-like structure mounting means for engaging, supporting and for moving a tube through a cutting station defined at said shearing head, said shearing head including means for guiding and for cutting said tube at said cutting station, said moving means including an energizable motor for advancing said engaging means with respect to said shearing head, means for energizing and deenergizing said motor to impart a pulsing operation thereto in which said engaging means is advanced in pulse-like increments of motion, a signal device operatively connected to the drive shaft of said motor to move therewith, and sensing means associated with said signal device and responding to motion thereof to preclude an operation of said cutting means while said signal device is in motion.

4,082,023

CABLE CUTTER

Lars-Olov Hertsius, Bromma, and Anders Arneborn, Taby, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 20, 1977, Ser. No. 798,766
Claims priority, application Sweden, Jun. 22, 1976, 7607166
Int. Cl.[2] B23D *25/12*; B26D *5/24*
U.S. Cl. 83—293 **1 Claim**

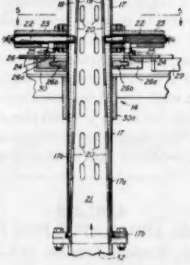
1. An arrangement to measure and cut a cable or the like in chosen lengths when rerolling it for delivery, said arrangement comprising rotatable cutting tools, a measuring wheel and a grip-and-pulling-wheel which is pressed against the measuring wheel, characterized in that the grip-and-pulling-wheel of the cable is connected to one of the rotatable cutting tools by means of a clutch mechanism being arranged to be electromagnetically set either to let the grip-and-pulling-wheel pull the cable and to prevent the motion of the cable in the backward direction or to allow the motion of the cable in the forward as well as the backward direction.

4,082,024

POTATO STRIP CUTTER

Joseph L. Hodges, and Glen R. Green, both of Ontario, Oreg., assignors to Ore-Ida Foods, Inc., Boise, Id.

Filed Nov. 29, 1976, Ser. No. 745,537
Int. Cl.[2] B26D *7/06, 3/26*
U.S. Cl. 83—402 **13 Claims**



1. In apparatus for cutting items such as potatoes into strips, which apparatus comprises singulating conduit means followed by aligning conduit means, followed by knife conduit means, means for hydraulically feeding items to be cut into said singulating conduit means, and a strip-cutting knife device in said knife conduit means, the combination therewith of aligning mechanism in said aligning conduit means for aligning the longitudinal axes, of any of said items which are elongate, with the hydraulic flow path through said knife conduit means; said aligning mechanism comprising a series of elongate walls internally of said aligning conduit means and peripheral to the flow

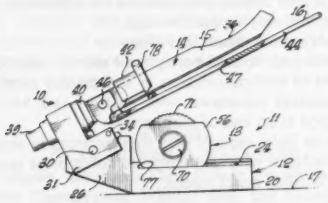
passage therethrough, each of said walls being hingedly connected to the conduit means at the upstream end of the wall but otherwise free along its length to move toward and away from the longitudinal axis of the conduit; means normally maintaining said walls at respective extreme positions of inward swing to define a flow passage of minimum cross-sectional area through the aligning conduit means; means for simultaneously and equivalently moving all of said walls outwardly to provide a flow passage of increased cross-sectional area through the aligning conduit means when an item, which is being hydraulically carried through the aligning conduit means, impacts against one or more of said walls; and passages in said walls permitting flow of hydraulic fluid to substantially equalize hydraulic pressure against said walls so they are not forced to increased cross-sectional area under hydraulic flow pressure.

8. In apparatus for cutting items such as potatoes into strips, which apparatus comprises singulating conduit means followed by aligning conduit means, followed by knife conduit means, means for hydraulically feeding items to be cut into said singulating conduit means, a strip-cutting knife device in said knife conduit means, and aligning mechanism in said aligning conduit means for aligning the longitudinal axes, of any of said items which are elongate, with the hydraulic flow path through said knife conduit means, said strip-cutting knife device being of pyramidal formation, with its apex directed toward the oncoming stream of hydraulically fed items during operation of the apparatus, and comprising mutually intersecting series of knife blades spaced from one another to provide a multiplicity of individual, side-by-side, box cutters throughout the cross-sectional area of the flow passage through the knife conduit means, said blades being nestingly interengaged and sharpened along their cutting edges such that each box cutter is fronted by a pair of slicer knife edges disposed at mutually different levels, stepwise, and is backed transversely thereof by a pair of stripper knife edges also disposed at mutually different levels, stepwise, the advance knife edge of each pair being beveled along its margin interiorly of the box, and the other knife edge of each pair being unbeveled, the beveled portion of the former knife edge being substantially entirely in advance of the latter knife edge, whereby advance cuts are made and spread in the instance of each pair for each box cutter before subsequent cuts are made by such pair.

4,082,025
RING CUTTING TOOL AND ACCESSORY

Helmut Reinbacher, 1350 Crescent Heights St., Los Angeles, Calif. 90046

Filed Mar. 31, 1976, Ser. No. 672,253
Int. Cl.[2] B26D *7/02, 7/06*
U.S. Cl. 83—411 R **1 Claim**

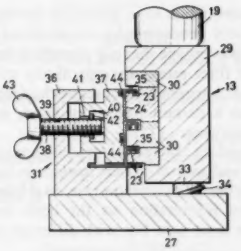


1. In a tool for cutting a ring transversely of the plane thereof, the combination of:
(a) saw support means;
(b) a circular saw rotatably mounted on said support means;
(c) jig means pivotally mounted on said support means for holding the ring and for moving the ring into cutting engagement with said circular saw with the plane of the ring perpendicular to the plane of said circular saw;
(d) said jig means including pivotally interconnected first and second jaw elements, said first jaw element being of a size to have the ring slipped thereover, and said second jaw element being pivotable toward said first jaw element to clamp the ring between said jaw elements;
(e) said second jaw element having a slot therethrough in the plane of said circular saw to permit said circular saw to pass through said second jaw element into cutting engagement with said ring; and
(f) said first jaw element having a groove therein in the plane of said circular saw to receive the periphery of said circular saw therein so that said circular saw can cut completely through the ring.

4,082,026
PORTABLE PRESS

Tatsuyoshi Miyazaki, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 10, 1976, Ser. No. 684,886
Claims priority, application Japan, May 12, 1975, 50-63522[U]
Int. Cl.[2] B26D *7/02*
U.S. Cl. 83—453 **8 Claims**



1. Notching apparatus for use between the bed and ram of a press, comprising:
(a) a base adapted to be supported on the press bed;
(b) a plurality of dies on said base, disposed one above the other;
(c) a punch holder supported on said base for sliding movement and adapted at one end to be driven by the ram;
(d) a plurality of punches on said holder disposed one above the other and each having cutting edge means for cooperating with the die in response to driven movement by the ram, there being means defining a recess beneath each of said cutting edge means receptive of the portion of the workpiece which is to be removed; and
(e) a workpiece presser adjustably carried on said base at one side of said punch holder, and adapted to engage the workpiece for biasing it in a direction transverse to that of said sliding punch holder movement for urging the workpiece to a fixed position of engagement against a lateral side of at least one of said punches.

4,082,027
ELECTRONICS MUSICAL INSTRUMENT

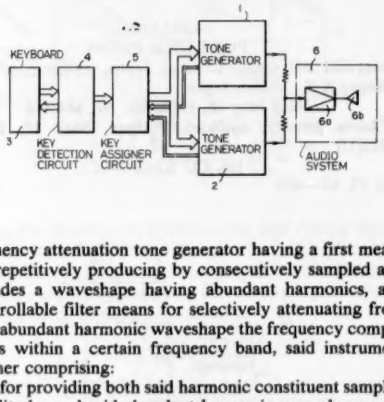
Teruo Hiyoshi; Akira Nakada; Shigeru Yamada, all of Hamamatsu; Kiyoshi Ichikawa, Hamakita, and Shigeki Ishii, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 20, 1976, Ser. No. 678,709
Claims priority, application Japan, Apr. 23, 1975, 50-49525; Apr. 25, 1975, 50-50559; Apr. 26, 1975, 50-51247
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **16 Claims**

9. An electronic musical instrument comprising:
keys;
key identification information generation means responsive to said keys for generating key identification and information; and
a plurality of musical tone generation systems producing

tone signals in a different way from each other according to the same key identification information from said key identification information generation means, wherein one of said tone generation systems includes:

a Fourier synthesis tone generator, responsive to said key identification information, for producing tone signals by combining the sampled amplitudes of individual harmonic constituents each weighted in relative amplitude by a harmonic coefficient for that constituent, and wherein another of said tone generation systems includes:



a frequency attenuation tone generator having a first means for repetitively producing by consecutively sampled amplitudes a waveshape having abundant harmonics, and controllable filter means for selectively attenuating from said abundant harmonic waveshape the frequency components within a certain frequency band, said instrument further comprising:

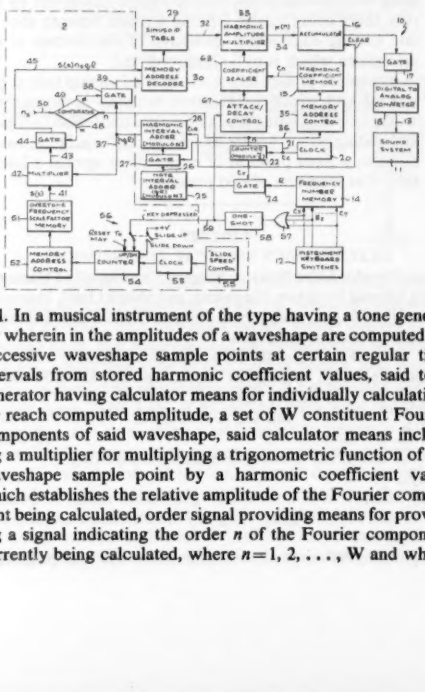
means for providing both said harmonic constituent sampled amplitudes and said abundant harmonic waveshape sampled amplitudes at a common rate established by said key identification information so tht both tone generators produce the same note but with different tonal qualities.

4,082,028

SLIDING OVERTONE GENERATION IN A COMPUTOR ORGAN

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 16, 1976, Ser. No. 677,705
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.24 **20 Claims**



1. In a musical instrument of the type having a tone generator wherein in the amplitudes of a waveshape are computed for successive waveshape sample points at certain regular time intervals from stored harmonic coefficient values, said tone generator having calculator means for individually calculating, for reach computed amplitude, a set of W constituent Fourier components of said waveshape, said calculator means including a multiplier for multiplying a trigonometric function of the waveshape sample point by a harmonic coefficient value which establishes the relative amplitude of the Fourier component being calculated, order signal providing means for providing a signal indicating the order n of the Fourier component currently being calculated, where $n=1, 2, \ldots, W$ and where nR corresponds to the nominal frequency of the n^{th} order Fourier component, and where R is a frequency number which establishes the fundamental frequency of the musical note being produced, accumulator means, connected to said calculator means, for combining said calculated components to obtain the waveshape amplitude at each sample point, and converter means for converting said computed waveshape amplitudes for successive sample points to musical sounds as said computations are carried out, the improvement for providing a sliding overtone effect, comprising:

first means, responsive to said Fourier component order indicating signal from said providing means, for providing a sliding overtone enable signal when a certain order Fourier component currently is being calculated, and

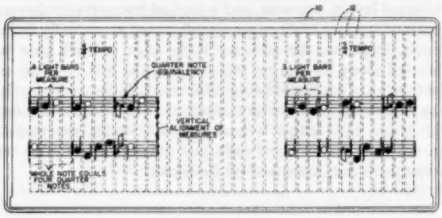
second means, responsive to occurrence of said sliding overtone enable signal and connected to said calculator means, for modifying the argument of the trigonometric function for said certain order Fourier component as a function of time, thereby causing the effective frequency of said certain order Fourier component to vary so as to produce a sliding overtone effect.

4,082,029

OPTICAL METRONOMES

David Orville Rumer, Jr., Rockford; Donald James Findlay, Wheeling; Arthur E. Neumann, Winnetka, all of Ill., and Juan M. Del Castillo, Risco No. 119, Mexico City, Mexico (20), assignors to Juan M. Del Castillo, Risco No. 119, Mexico City, Mexico

Filed Sep. 10, 1976, Ser. No. 722,283
Int. Cl.[2] G04F *5/02;* **G09B** *15/02*
U.S. Cl. 84—484 **9 Claims**



1. An optical metronome for designating visually the note of music to be played comprising

display panel means receiving a tempo or count pulse to sequentially illuminate the notes to be played in relation to the timing designated for the musical notation,

a sheet of music with the musical notation thereon located in front of said display panel means for sequential illumination by said display panel means,

said display panel means including

a plurality of vertical bars placed side by side forming a series of vertical columns in said display panel means

light sources associated with each of said vertical bars located at an end of said bars,

means to light each of said light sources in sequence in accordance with said tempo or count pulse received by said display panel means.

4,082,030

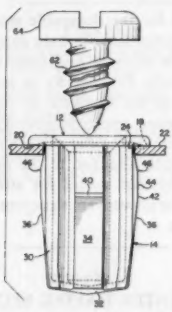
PLASTIC SCREW GROMMET

Lloyd A. Erickson, Park Ridge, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Mar. 25, 1977, Ser. No. 781,075
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—80 **8 Claims**

1. A one-piece plastic screw grommet for acceptance of a screw and adapted for use in a polygonal apertured panel, said grommet including an enlarged apertured head adapted to overlie one side of said panel and cover said aperture and a

depending shank complimentary in cross section to said panel aperture, said shank including a plurality of substantially rigid posts extending axially from said head in each corner of said shank and so positioned as to be located in each corner of the polygonal aperture, an end element interconnecting the free ends of said posts and spaced from said head to form a closed free entering end on said shank, a plurality of polygonal legs extending axially from and each connected at opposite ends to said head and said end element, each leg having an axially extending transversely concave inner surface spaced from the axis of said shank a predetermined distance and each said leg positioned medially between an adjacent pair of posts, said concave inner surfaces of said legs forming the bore of said shank and normally lying substantially on the pitch diameter of said screw and coaxial with said head aperture, each leg having panel engaging means on its outer surface and a pair of side surfaces interconnecting said outer surface and the concave inner surface, a spring-like thin web-like member extending integrally from each side surface of said legs adjacent to its



inner concave surface and connected at the opposite end to each adjacent post, said thin web-like members and said legs extending continuously from said head to said end element which covers the entire free end of said shank, each pair of adjacent spring-like elements being spaced from each other as they extend from adjacent legs to a common one of said posts to thereby form a plurality of radially disposed slots extending between said bore and said corner posts, said legs, said spring-like elements and said posts forming a closed periphery for said shank, each side of said shank further including axially extending grooves defined by the side surfaces of said legs and their adjacent connected web-like members extending to said corner posts, said posts and the exterior surface of the legs opposite the bore surface defining the external polygonal configuration of said grommet which is complementary to said polygonal aperture, whereby said legs are adapted to flex radially inwardly against said spring-like elements during insertion into said polygonal aperture and flex outwardly upon insertion of said screw in said bore.

4,082,031

GEAR HOBBING MACHINES

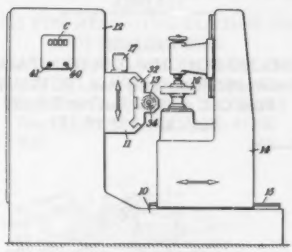
Brian Hodgson, Rowlands Gill; Robert Fairnington, Wylam; Malcolm Thorneycroft, Whitley Bay, and Ronald Malcolm Grant, Chester le Street, all of England, assignors to Charles Churchill Limited, Coventry, England

Filed Jul. 7, 1976, Ser. No. 703,303

Int. Cl.[2] B23F *5/22*

U.S. Cl. 90—4 **4 Claims**

1. In a gear hobbing machine, the combination of a support, a rotatable hob, a slide mounting the hob for axial shifting on the support, a stepping motor operatively connected to the slide, a pulse source comprising a squaring circuit for deriving square pulses from the power supply and a frequency divider connected to the output of the squaring circuit, a relay energizable at the conclusion of a hobbing cycle and operative, when energized, to apply pulses from said frequency divider to the motor and thereby to cause the motor to impart a predetermined axial movement to the slide in response to each pulse, a



subtractive counter for counting the pulses applied to the motor and a connection between the counter and the relay and operative to de-energize the relay, and thereby stop the motor, when the count in the counter is reduced to zero.

4,082,032

CONTROL OF HYDRAULICALLY POWERED EQUIPMENT

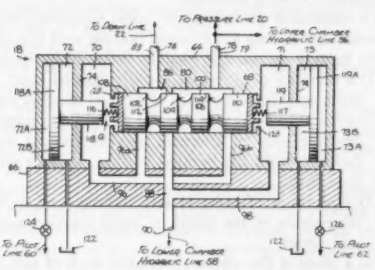
William J. Swenson, Houston, Tex., assignor to Raymond International, Inc., Houston, Tex.

Division of Ser. No. 523,502, Nov. 13, 1974, Pat. No. 4,020,744.

This application Oct. 13, 1976, Ser. No. 731,933

Int. Cl.[2] F01B *15/00, 7/18;* **F01L** *25/06*

U.S. Cl. 91—216 B **7 Claims**



1. A hydraulically powered hammer with adjustable delay hydraulic switching comprising a ram; means guiding said ram for reciprocal movement along a given path and against an anvil; hydraulic piston and cylinder means connected to move said ram; a hydraulic switching valve connected to control operation of said piston and cylinder means and including a housing, a valve spool mounted for reciprocal movement along a bore within said housing, said housing being formed with passageways for a fluid which follows different paths for different switched positions of said valve spool; said valve including feedback means to hold the spool in each switched position until an actuation force is applied thereto; valve actuation means comprising pilot fluid supply means for initiating a flow of pilot fluid from said cylinder to said valve upon the passage of said ram past a predetemined location along said path; said valve further including fluid accumulation means connected to receive said flow of pilot fluid through a pilot pressure line, said accumulation means including at least one fluid accumulation chamber located at one end of said valve spool, a piston in said chamber for movement in the direction of said spool and spool contact means extending from said piston toward said one end of said spool for applying an actuating force to said spool in response to the accumulation of a predetermined volume of fluid in said accumulation chamber, said contact means having a length such that a finite gap exists

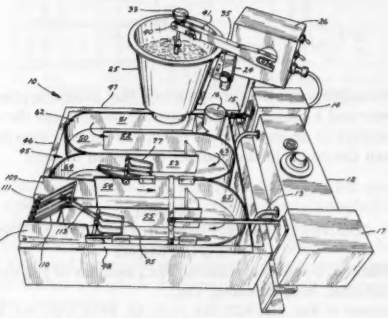
between said contact means and said spool when said piston is furthest away from said spool and the spool is in its extreme position toward said piston and means for adjusting the duration between said initiation of pilot fluid flow and said accumulation of a predetermined volume of fluid.

4,082,033

AUTOMATIC DOUGHNUT MAKING MACHINE

Amos M. Fester, 1821 University Ave., St. Paul, Minn. 55101

Filed Oct. 4, 1976, Ser. No. 729,089
Int. Cl.² A47J 37/12
U.S. Cl. 99—406 **9 Claims**



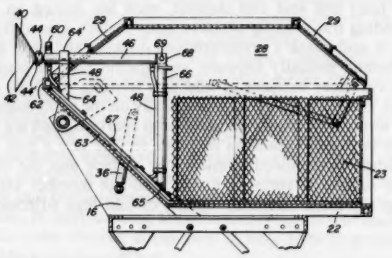
1. A doughnut making machine comprising:
(A) a vessel adapted to contain a liquid cooking medium,
(B) heating means disposed in the bottom of said vessel to heat the cooking medium,
(C) a removable guide channel insert supported within the vessel and having a horizontal bottom wall spaced above the heating means, said channel insert comprising:
(1) a plurality of elongated parallel spaced apart vertical walls defining a plurality of parallel channel segments,
(2) a plurality of arcuate vertical walls interconnecting the opposite ends of alternate parallel vertical walls and defining, with the parallel vertical walls, a serpentine flow path,
(3) a plurality of holes in said bottom wall to facilitate submersion of the insert in liquid cooking medium in said vessel,
(4) a pivoted flap closure covering each of said holes to provide a one way valve to retain said liquid medium in said submersed insert, and
(5) a propulsion pump at the upstream end of the first of said channel segments,
(D) dough expelling means movably mounted above the vessel over the upstream end of the first of the channel segments immediately downstream from said pump,
(E) power means to drive said dough expelling means,
(F) an open turn-over means pivotally mounted between two of said vertical channel walls at the approximate midpoint of said serpentine flow path,
(G) hold-back means operatively connected to said turn-over means to hold back partially cooked doughnuts when the turn-over means is in operation,
(H) an open doughnut discharge means pivotally mounted between two of said vertical channel walls adjacent the downstream end of said serpentine flow path,
(I) hold-back means operatively connected to said discharge means to hold back cooked doughnuts when the discharge means is in operation,
(J) pivotally mounted doughnut ejector means operatively connected to the hold back means of said discharge means to receive cooked doughnuts therefrom and eject them from the vessel, and
(K) power means for operating said turn-over means and discharge means in unison.

4,082,034

COTTON PRESS

Luther R. Wright, Rte. 1, Roscoe, Tex. 79556

Filed Jan. 3, 1977, Ser. No. 758,695
Int. Cl.² B30B 5/00
U.S. Cl. 100—240 **8 Claims**



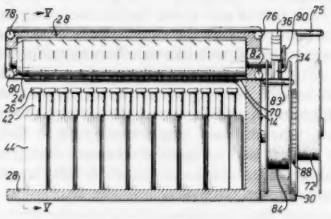
1. An attachment for the dumpable storage box of cotton picker apparaatus comprising; a main support plate, brackets mounted on opposite sides of said main support plate at an angle of approximately 45° thereto, at least one power ram structure attached to the brackets so the operating action thereof will be in a plane approximately 45° from the plane of the main support plate, and a flat surface member suitable for contacting loose cotton attached to the power ram structure for operation thereby, and means for attachment of the flat surface member to the power ram structure which means being a pivotal connection.

4,082,035

HIGH SPEED PRINTER HAVING SEGMENTED DRUM

Gosta Roland Englund, Stockholm, Sweden, assignor to Svenska Dataregister AB, Sweden

Continuation of Ser. No. 593,153, Jul. 3, 1975, abandoned, which is a continuation of Ser. No. 406,090, Oct. 12, 1973, abandoned.
This application Mar. 18, 1977, Ser. No. 779,125
Claims priority, application Sweden, Nov. 2, 1972, 14234/72
Int. Cl.² B41J 3/06
U.S. Cl. 101—93.04 **5 Claims**



1. A printing device for printing characters onto a record medium comprising:
a printing station;
carrier means provided with a plurality of character segments, said character segments being adapted to collectively define an entire font of characters;
moving means for intermittently moving said carrier means to thereby move a particular one of said character segments through said printing station during each such intermittent movement of said carrier means;
record feeding means for intermittently feeding said record medium through a predetermined amount through said printing station;
hammer means for striking said record medium against said carrier means; and

control means for controlling said moving means and said record feeding means in a predetermined sequence of steps;

said moving means moving said carrier means under control of said control means during particular steps in said predetermined sequence of steps;

said record feeding means feeding said record medium through said predetermined amount under control of said control means during certain steps in said predetermined sequence of steps;

said carrier means and said record medium being independently moved during specified steps and being simultaneously moved during other specified steps in said predetermined sequence of steps;

said control means selectively actuating said hammer means to thereby print the particular one of said character segments located at said printing station onto said record medium; whereby

a character is formed by selective actuation of said hammer means after controlled movement of said carrier means and said record medium.

4,082,036

INK TROUGH DIVIDERS FOR ENDLESS BAND SCREEN PRINTER

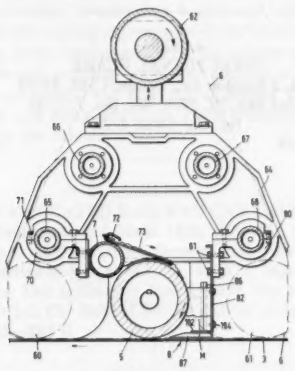
Mathias Mitter, Schloss Holte, Germany, assignor to Mitter & Co., Schloss Holte, Germany

Filed Mar. 30, 1976, Ser. No. 672,074

Claims priority, application Germany, Apr. 3, 1975, 2514586

Int. Cl.[2] B41F *15/10, 15/40*

U.S. Cl. 101—122 **21 Claims**



1. A screen printing machine, comprising an endless printing screen an inwardly directed screen surface of which bounds a space having opposite open ends; a plurality of supporting rollers extending through said space and mounting said printing screen for travel in an endless path in which a part of said printing screen forms a printing run; a driven squeegee roller also extending through said space and having a circumferential surface defining with a portion of said inwardly directed screen surface of said printing screen a trough which extends axially of said squeegee roller and is located ahead of the same, as considered in the direction of travel of said printing screen; means for feeding flowable printing medium into said trough so that the medium forms a pool therein; and confining means extending across said trough at locations which are spaced lengthwise of said trough, for confining the medium therein, said confining means comprising confining elements each having a curved first surface shaped to snugly conform and partly surround said circumferential surface of said squeegee roller and extending to said inwardly directed screen surface and a second surface juxtaposed in sealing contact with said inwardly directed screen surface which slides past said second surface so as to prevent escape of said printing medium between said second and said inwardly directed surfaces while permitting unobstructed travel of said printing screen in said endless path.

4,082,037

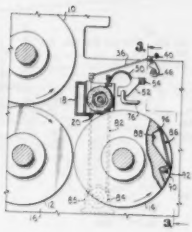
APPARATUS FOR REMOVING DUSTING POWDER IN OFFSET PRESSES

C. Ronald Grindley, 108 W. 15th, Higginsville, Mo. 64037, and Larry G. Boyd, 7111 E. 107th Ter., Kansas City, Mo. 64134

Filed Oct. 28, 1975, Ser. No. 626,456

Int. Cl.[2] B41F *35/00;* **B41L** *41/00*

U.S. Cl. 101—425 **10 Claims**



1. Apparatus for removing liquid-mixable, dry particulate matter from sheets under movement in a printing press, said apparatus comprising:

a cleaning roller having a dry, soft, fibrous surface adapted for wiping contact with said sheets;

means for supporting said roller adjacent said sheets;

drive means connected with said roller for rotating the latter to cause said surface thereof to wipe said sheets and collect said dry particulate matter;

a receiver spaced from said roller;

a doctor blade engaging said surface as the roller rotates for stripping the collected matter therefrom;

guide means for receiving the particulate matter stripped from said surface by said blade, and including a member extending from adjacent said blade to said receiver,

said member having a guide surface defining a flow path adjacent said guide surface along which the stripped matter flows under the centrifugal force of the rotating roller, whereby the stripped matter is directed into the receiver by the action of the roller, doctor blade and guide means; and

a quantity of liquid in which the stripped matter is mixable, said liquid being contained in said receiver for retaining the stripped matter directed thereinto, whereby the retained matter is carried away upon removal of the liquid from the receiver and resupply of liquid thereto.

4,082,038

APPARATUS FOR AUTOMATICALLY REMOVING DUST FROM A FORM CYLINDER OF A PRINTING MACHINE

Tadayoshi Ueno, Koganei, and Akio Itaya, Tokyo, both of Japan, assignors to Hitachi Printing Co. Ltd. and Nikka Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 5, 1977, Ser. No. 784,688

Claims priority, application Japan, Apr. 7, 1976, 51-38187; Apr. 7, 1976, 51-41992

Int. Cl.[2] B41F *35/02*

U.S. Cl. 101—425 **9 Claims**

1. An apparatus for automatically removing dusts from form-cylinder of a printing machine, comprising:

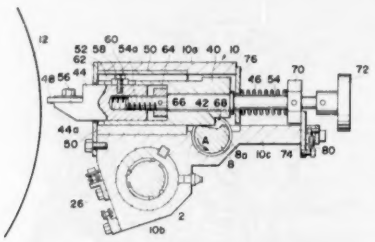
brackets adjacent to the ends of said form-cylinder;

a guide member connected with said brackets;

a movable body slidably contacted with said guide member such that the former is slidable substantially along the entire length of the latter, said movable body having

slidable structure which has a tip member at the end thereof and is slidable toward the rolling surface of said form cylinder, a base portion, an extended portion having a flat upper surface, a housing in which said slidable structure is positioned, a bush member confined between said housing and said slidable structure, said slidable structure having a tip holder, a sleeve member and a first shaft, said first shaft having a stopper member at the end thereof and being inserted through said sleeve member, and a spring confined between said housing and said stopper member;

means for moving said slidable structure toward the rolling surface of said form cylinder, having a second shaft which



is rotatably connected with said brackets and has a shoulder along substantially the entire length thereof and a device for rotating said second shaft in the clockwise and counter-clockwise directions at predetermined angles, whereby when said second shaft is rotated at the predetermined angles, said shoulder presses said slidable structure toward the form cylinder;

means for moving said movable body along said guide member;

a first electrical device which controls the movement of said movable body along said guide member; and

a second electrical device which controls the movement of said slidable structure.

4,082,039

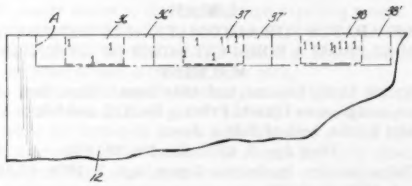
DUPLICATOR CONTROL BY AREA SCANNED CODED MASTER

Elmer F. Schutt, Parma; Bryce G. Thornton, Mentor, and Charles R. Bentivegna, Jr., Mayfield Heights, all of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 412,347, Nov. 2, 1973, abandoned. This application Oct. 1, 1975, Ser. No. 618,362

Int. Cl.[2] B41M *1/06*

U.S. Cl. 101—450 **6 Claims**



2. A duplicating machine for providing copies of an original comprising:

a rotatable cylinder supporting the original having at least one group of numerical identification data in the form of separate marks arrayed on the original so as to be disposed generally along a path running peripherally of the cylinder when the original is in place thereon;

a reading station including sensing means disposed adjacent said cylinder, for sensing each mark in turn during rotation of said cylinder with the original thereon and for providing unit value data signals, one for each mark sensed;

summing means comprising register means connected with said sensing means for progressively summing the unit value data signals emanating therefrom, for expressing the total number of such unit value data signals received from said sensing means according to a number system having a base greater than one, and for storing the thus expressed total in signal form; and

means responsive to the signals stored by said summing means for controlling a function of the duplicating machine.

4,082,040

LITHOGRAPHIC PRINTING PLATE

Toshiro Yamashina, Sappro, and Hirokazu Sakaki, Yoshida, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 30, 1976, Ser. No. 710,038

Claims priority, application Japan, Aug. 1, 1975, 50-93830

Int. Cl.[2] B41N *1/08*; G03F *7/08*

U.S. Cl. 101—456 **5 Claims**

1. A lithographic printing plate comprising a flat, thin support, a layer of aluminum nitride formed thereon by radio frequency reactive sputtering and a light-sensitive layer over said aluminum nitride layer, said layer of aluminum nitride having a thickness of from about 100 A to about 10,000A, and said aluminum nitride surface coated or converted by a hydrophilizing treatment piror to the coating of said light-sensitive layer.

4,082,041

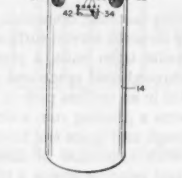
DIRECTIONAL FLARE

John S. Wilson, 3 Kelldon Dr., Felton, Calif. 95018

Filed Sep. 29, 1976, Ser. No. 727,735

Int. Cl.[2] F42B *4/28*

U.S. Cl. 102—35 **15 Claims**



1. A directional flare system comprising:

a flare adapted to emit light generally isotropically when actuated;

an opaque shield located to one side of said flare and adapted to prevent the transmission of light from the flare throughout a preselected sector about a vertical axis passing through the flare;

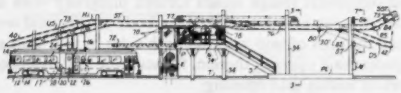
means for suspending the opaque shield and the flare in the air while the flare is emitting said light; and

means for automatically maintaining the opaque shield in a preferred angular orientation about said vertical axis while the the flare is emitting said light.

4,082,042
OVERHEAD CONTAINER TRANSFER SYSTEM

Leonard D. Barry, 19300 Pennington Dr., Detroit, Mich. 48221

Continuation of Ser. No. 405,825, Oct. 12, 1973, abandoned.
This application Jul. 30, 1976, Ser. No. 710,214
Int. Cl.[2] B61K *1/00*
U.S. Cl. 104—18 20 Claims

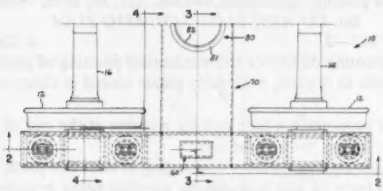


1. An overhead container transfer system for unloading and loading transportation vehicles passing a station, including a lower guideway having at least one transportation vehicle thereon, an overhead track run over said guideway for vertical transfer including a slope down and an opposite slope up, at least two transfer containers, a said container being on said vehicle when approaching said station track to meet said slope up from bottom, carrier means for engaging and suspending said containers to travel said overhead track and up said slope, vertical coupling means on said vehicle for pushing said container up said slope up above said vehicle, said overhead track being sloped up to height to carry container above the vehicle and any load thereon, conveying means above said vehicle and along said station track to receive and move the container lifted out to stop for transfer at the station, and accelerating means for starting and accelerating the second said container on said station track including a dip in said track to lower the outgoing container to coupling height and reach coupling speed ahead of coupling alignment with the vehicle to be set on the vehicle, said coupling means on the vehicle engaging said container at safe coupling speed and aligning container over spot to set on vehicle and hold this alignment while pushing container to and along where said track is sloped down to set container on the vehicle.

4,082,043
FABRICATED RAILWAY CAR TRUCK

James C. Hammonds, and Jan D. Holt, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 447,823, Mar. 4, 1974, abandoned. This application Nov. 1, 1974, Ser. No. 519,976
Int. Cl.[2] B61F *3/08, 5/14, 5/30, 5/36*
U.S. Cl. 105—182 R 13 Claims

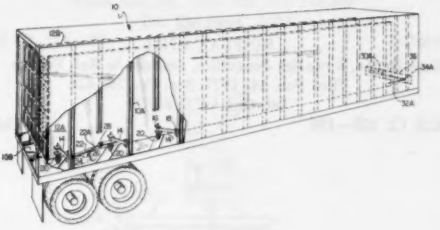


1. A transverse member for a railway car truck adapted to be located between spaced side frames of said truck; said transverse member being elongated and having a cross section including a pair of longitudinally extending sides and a member joining said sides defining a hollow portion having an open bottom such that the shear center of said cross section is spaced upwardly from the neutral axis of said cross section throughout its length; a center bearing located at about the mid portion of said transverse member at about said shear center for receiving a cooperating car body center connection of a railway car body; said center bearing having sufficient vertical surface area to transmit horizontal loads radially between the car body and said truck; said center bearing being spaced upwardly from said neutral axis a distance sufficient to prevent substantial torsional deflection of said transverse member.

4,082,044
ADJUSTABLE FLUID DUNNAGE SYSTEM

Gerald Glynn Day, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Sep. 29, 1975, Ser. No. 617,567
Int. Cl.[2] B60P *7/14, 7/16;* B61D *3/00, 45/00*
U.S. Cl. 105—376 16 Claims



1. A dunnage system for restraining cargo in the freight compartment of a transport vehicle comprising:

at least one movable parallel wall disposed on one side of said freight compartment and in parallel with the longitudinal side walls of said freight compartment;

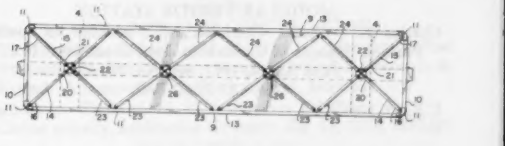
drive means for moving said wall transversely of said freight compartment into and out of restraining engagement with said cargo; and

means for operating said drive means in response to changes in the pressure that the movable wall is exerting on the cargo for maintaining a constant and adjustable pressure of said movable wall on said cargo prior to and during transport thereof.

4,082,045
STABILITY BRACING FOR TWIST ON HIGH GONDOLAS OR HOPPER CARS

George S. McNally, South Holland, Ill.; Dilip T. Naik, Hammond, and John H. Spence, Munster, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 7, 1976, Ser. No. 730,510
Int. Cl.[2] B61D *17/00*
U.S. Cl. 105—411 5 Claims



1. An open top high volume railway car body including a pair of side walls and interconnecting end walls defining vertically extending corner portions,

a car underframe connected to a lower portion of said body including center bearing assemblies adapted to support said underframe on longitudinally spaced car trucks,

said underframe including a center sill and longitudinally spaced transversely extending horizontal support means supported on said bearing assemblies, the intersection of said center sill and said horizontal support means defining minimum vertical flexure portions longitudinally spaced from said end walls and laterally inwardly from said side walls

bracing means extending the length of the car body and reactive therewith to resist sagging and end-to-end torsional twisting thereof,

said bracing means including a plurality of serially interconnected V-shaped trusses,

said trusses each having downwardly inwardly longitudinally convergent reinforcing braces including upper end sections adjacent an associated side wall and lower end sections terminating adjacent said center sill and

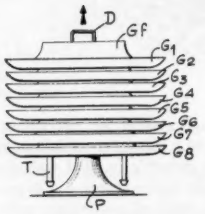
upper coupling means securing said upper end sections to said associated side wall and lower coupling means securing said lower end sections at spaced locations along said center sill wherein two of said locations are at said minimum flexure portions.

4,082,046

DISPLAY UNIT

Yves Baglin, 8 rue des Jonquilles, Boissise le Roi, France

Filed Feb. 14, 1977, Ser. No. 768,424
Int. Cl.² A47B *46/00*
U.S. Cl. 108—106 **4 Claims**



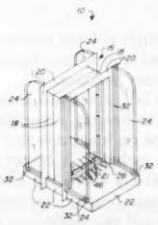
1. A collapsible display unit comprising a plurality of superposed identically formed shelves adapted to receive articles to be displayed when the unit is extended, said display unit being normally stored in collapsed condition, each of said shelves including support means in slidable engagement with an adjacent shelf by means of a series of holes in said shelf, said support means comprising a set of vertical rods rigidly secured to, and depending from, the bottom surface of each shelf and provided at their lower ends with locking means, said locking means engaging both the top and bottom surfaces of the adjacent shelf for positive locking engagement when a shelf is extended away from said adjacent shelf by a predetermined distance and preventing not only the shelves from being pulled apart and separated from each other when the unit is being expanded but also preventing collaping of the shelves one upon another once they have been expanded.

4,082,047

MODULAR VISITOR STATION

Charles V. Williams, Charlotte, N.C., assignor to Southern Business Systems of Greensboro, Inc., Greensboro, N.C.

Filed Apr. 4, 1977, Ser. No. 784,229
Int. Cl.² E05G *5/00*
U.S. Cl. 109—21.5 **10 Claims**



1. A modular visitor station for use in a jail, prison or similar institution including a wall having an opening therein, said visitor station including at least one unit for permitting visual and voice communicating between first and second persons respectively disposed on opposite sides of said wall while prohibiting contact and the passage of materials between said persons, said unit comprising:

an upright frame assembly having a main body portion with an open center section mounted within said opening, and with a bottom section disposed in closely adjacent overlying relationship to the bottom extremity of said opening; and peripheral flange means formed integrally with and extending laterally from said main body portion and overlying surfaces of said wall, on both sides of said wall and adjacent said opening therein, for securing said main body portion within said opening;

a generally vertically extending transparent viewing pane fixedly mounted within said center section of said main body portion of said frame assembly, at a location approximately midway of the depth dimension of said frame assembly, for permitting visual communication between persons disposed on opposite sides of said wall;

and combination sound-box and shelf means extending generally horizontally, in underlying relationship to said transparent pane and in overlying engaging relationship to said bottom section of said main body portion of said frame assembly, through and outwardly from said open center of said frame assembly; said combination means comprising an elongate, hollow box-like member, of essentially unitary construction including vertically-spaced and generally parallel top and bottom panels, fixedly secured centrally of its length to said frame assembly and projecting in the direction of its opposite ends freely and distally outwardly from said frame assembly and from the opposite sides of said wall; the said top panel of said box-like member having perforate surface portions adjacent to and on opposite sides of said transparent pane and having relatively larger imperforate surface portions adjacent its opposite ends, said member being adapted to transmit sound through its interior and through at least said top panel thereof between persons upon opposite sides of said wall, and said imperforate surface portions of said member defining shelf-like areas respectively usable for writing and similar purposes by persons on opposite sides of said wall.

4,082,048

PLANTING DIBBLE

Erik Hilding Grundström; Gote Einar Grundström, and Ivar Waleij, all of 8 Sockenvagen, Dorotea, Sweden (S-910 70)

Filed Apr. 27, 1976, Ser. No. 680,799
Claims priority, application Sweden, Apr. 30, 1975, 7505054
Int. Cl.² A01C *11/02, 5/04;* A01G *23/04*
U.S. Cl. 111—2 **4 Claims**

1. A planting dibble for the mechanical planting of plants in holes made in the soil, preferably plants rooted in clods, comprising:

a tube supporting a hole-making member at the end of said tube facing toward the soil;

said hole-making member comprising at least two parts, said two parts of said hole-making member being arranged at respective lower ends of respective spaced sliding plates guided in respective diverging guide grooves;

said guide grooves diverging upwardly from said tube end;

each of said plates connected by means of a common transverse pin slidably mounted in a hole with a slide bushing in each respective plate;

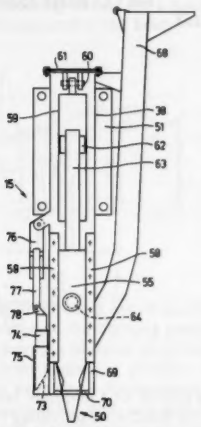
said common transverse pin connected for reciprocal movement along the longitudinal axis of said tube to a piston-cylinder means provided within said tube;

said piston-cylinder moving said pin connected plates in said guide grooves and therefor said two parts from a closed position closing said end of said tube to a spread-apart position opening said end of said tube and, from said spread-apart position to said closed position, each said

slide bushing allowing said common transverse pin to adjust to either position;

said closed position defining a hole-making position and a plant waiting position for a plant to be planted;

a transport pipe for feeding a plant to said waiting position, said transport pipe being attached to the outside of said tube and opening into said tube directly above the defined waiting position and below the lowest position of said common transverse pin; and



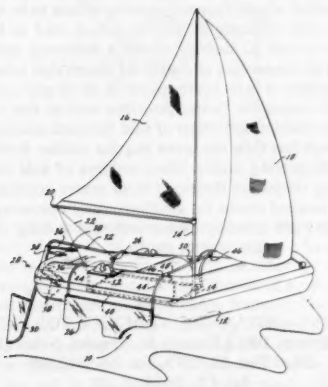
an apertured plate connected to said lower end of said tube, the inner circumferential edge of said apertured plate defining a means for supporting and holding together said at least two parts of said hole-making member within the aperture in said apertured plate during reciprocal movement to and from said closed position and said spread-apart position.

4,082,049

SAILING CRADLE

Henry A. Nicol, 5210 Roundmeadow Rd., Hidden Hills, Calif. 91302

Filed Dec. 8, 1976, Ser. No. 748,525
Int. Cl.[2] B63B *35/00*
U.S. Cl. 114—39 **14 Claims**



9. A kit of disassembled components adapted when assembled to form a sailing combination for an inflatable boat having buoyancy tubes, comprising:

(a) a forward cradle member including port and starboard buoyance tube enclosing elements and upper and lower athwartships cross members having mast receiving means;

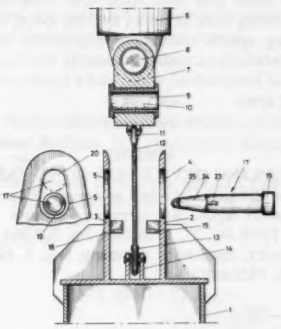
(b) port and starboard strut members positioned to ride at the floor of the boat and adapted to connect said forward cradle member in a sailing cradle.

4,082,050

COUPLING BETWEEN AN ANCHOR UNDER WATER AND A BUOYANT BODY

Willem Jan van Heijst, Monte Carlo, Monaco, assignor to Single Buoy Moorings, Inc., Fribourg, Switzerland

Filed Aug. 30, 1976, Ser. No. 719,589
Int. Cl.[2] B63C *7/00*
U.S. Cl. 114—53 **7 Claims**



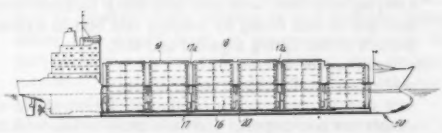
1. A coupling between a buoyant body and an anchor, comprising a pair of perpendicular hinged shafts, one of said shafts comprising an internal bush, the other of said shafts being disposed above said bush, a pin insertable in the bush, a pair of spaced parallel cheeks upstanding from the anchor, the pin being of a length greater than the distance between the cheeks, the cheeks having vertically elongated holes therein whose upper ends are of a size to receive the pin and whose lower ends are larger than said upper ends, and a pulley on the anchor, between said cheeks, about which a cable is reeved and secured to said one shaft for pulling said coupling downward, whereby when said bush is aligned between said lower ends of said holes, said pin is insertable in said bush, and when the upward force of said buoyant body pulls the coupling upward, said pin is pulled up into said upper ends of said holes.

4,082,051

CONTAINER SHIP CONSTRUCTION

Peter Timmann, Lubeck, and Heinrich A. Steinborn, Bad Schwartau, both of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft Werk Lubeck, Germany

Filed Jul. 12, 1976, Ser. No. 704,485
Claims priority, application Germany, Jul. 15, 1975, 2531487
Int. Cl.[2] B63B *11/02*
U.S. Cl. 114—72 **8 Claims**



1. A container ship comprising a hull having outer starboard and port side walls, a bottom structure extending between said side walls, a longitudinal bulkhead spaced inwardly from each side wall and extending substantially coextensive in height above said bottom to said side walls, a transverse bracing deck interconnecting said side walls and said longitudinal bulkheads

at the level of the top of said side walls and bulkheads, said ship defining a container bottom loading space above said bottom and between said longitudinal bulkheads, said bracing deck including longitudinally spaced frame members extending transversely between said side walls and defining openings therebetween extending above said bottom loading space, a plurality of top longitudinal walls extending upwardly above and supported on said bracing deck, a plurality of transverse support frames extending above and supported on said bracing deck and connected to said longitudinal walls at longitudinally spaced intervals, support frames and longitudinal walls on each side of the ship forming a substantially continuous wall, a plurality of transverse bulkheads extending between said longitudinal bulkheads in said loading space and extending above said loading space adjacent said frames, the space between said longitudinal walls and said transverse bulkheads defining above said bracing deck an upper loading space, the lower and upper loading spaces containing continuous stowage rack means for containers extending upwardly from said bottom to the top of said longitudinal walls, and a hatch cover covering each loading space.

4,082,052

COUPLING DEVICE FOR CONTAINERS

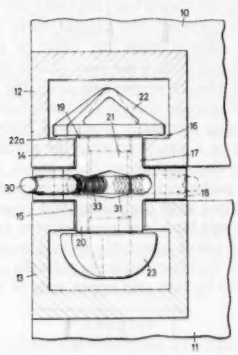
Arnold Looks, Bremen, Germany, assignor to Conver Ingenieur-Technaik GmbH & Co., KG, Bremen, Germany

Filed Jul. 27, 1976, Ser. No. 709,014

Claims priority, application Germany, Sep. 6, 1975, 2539741; Sep. 13, 1975, 7529082[U]

Int. Cl.[2] B63B *25/24*

U.S. Cl. 114—75 **13 Claims**



1. A coupling device for detachable connection to at least one container fitting having a slot within a face thereof, said device comprising:

a casing for abutment with the container fitting overlying said slot,

a locking pin having at least at one end an integral hammer-head bolt,

said casing including a longitudinal opening for rotatably carrying said bolt, with said bolt being lockable within said slot to said fitting by rotating said bolt to overlie a portion of said fitting adjacent said slot,

the improvement wherein:

said casing is of one-part construction,

said opening comprises a continuous aperture, and said aperture is so disposed and has a cross-section such that said bolt can be introduced through said casing aperture and rotated to a working position to effect assembly of said locking pin and said casing, and said casing further comprises means for limiting bolt rotation to end operating positions after rotation to said working position which respectively effects locking of said fitting to said casing and release of said fitting from said casing while preventing said bolt from passing back through said casing aperture.

4,082,053

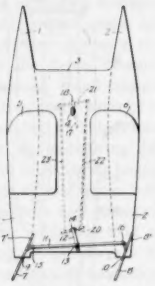
MULTIRUDDER STEERING SYSTEM FOR MULTIHULL BOATS

William R. Woodward, 520 E. 76th St. (Apt. 8C), New York, N.Y. 10021

Filed Sep. 30, 1976, Ser. No. 728,067

Int. Cl.[2] B63H *25/06*

U.S. Cl. 114—163 **23 Claims**



1. A steering system for a multihull boat having at least two parallel elongated hull bodies providing for flotation of a structure maintaining said hull bodies in substantially fixed relation to each other, said steering system comprising:

aft steering means including at least one rudder mounted at least partly below the waterline on the stern portion of at least one of the hulls of the boat;

forward steering means including at least one rudder mounted forward of amidships on said structure, extending below the waterline level in at least one space between two hulls and pivoted on an axis located between said two hulls and abreast of the normally submerged portion of at least one of said two hulls, said location being, in terms of the fore-and-aft dimension, closer to the location about which the boat normally pivots when tacking about when sailing close-hauled than is the location of said aft steering means;

means for mechanically linking said aft steering means and said forward steering means for simultaneous control of both of them and for causing the after edge of said at least one rudder of said forward steering means to be deflected to the side opposite to that to which said at least one rudder of said aft steering means is deflected, said linking means so connecting said steering means that when one of said rudders is in its center position, all of said rudders are in their respective center positions, and so that the mean angular rudder deflection of said forward steering means is always less than the mean angular rudder deflection of said aft steering means when rudders of said respective steering means are deflected from center position, and

steering control means for simultaneously operating said aft and forward steering means and said linking means by means of a single control motion.

4,082,054

DOCKING AND MOORING DEVICE FOR A BOAT

Frank D. Bruner, 10012 Emmett St., Omaha, Nebr. 68134

Filed Dec. 19, 1975, Ser. No. 642,319

Int. Cl.[2] B63B *21/00*

U.S. Cl. 114—230 **7 Claims**

1. A docking and mooring device for a boat comprising:

a line adapted to be secured on one end to the boat;

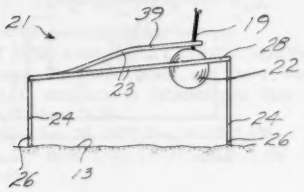
a connector secured to the other end of said line; and

a guide unit disposed proximate the docking position of the

boat and having an open ended trap including an inner rim formed in a generally V-shaped configuration for coacting with said connector, said guide unit includes an arcuate outer rim having diverging ends; a pair of curved sections, each integral on one end with one of said diverging ends with the other ends thereof converging toward each other; and said V-shaped inner rim forming said trap is disposed substantially within said outer rim with the free ends thereof integral with said converging ends thus forming an endless element.

7. A docking and mooring device for a boat comprising:

a line adapted to be secured to the boat;



a connector secured to the other end of said line; and a guide unit disposed proximate the docking position of the boat including a base having a plurality of spaced teeth projecting away therefrom forming a plurality of open ended traps, and further including a disconnector secured to said guide unit and cooperably with said line for disengaging said connector, said disconnector including a boss having one end secured to said guide unit proximate said open ends of said traps and having a free end projecting substantially normally from said guide unit, and a hook element integral with said boss free end.

4,082,055

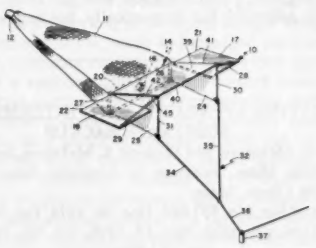
NEUSTON NET APPARATUS

Daniel Maitland Brown, San Diego, Calif., assignor to Regents of the University of California, Berkeley, Calif.

Filed Nov. 1, 1976, Ser. No. 737,785

Int. Cl.[2] B60P *21/56;* B63B *21/64;* B63G *8/42*

U.S. Cl. 114—245 **7 Claims**



1. A neuston net apparatus for guiding a net to be towed at the surface of a body of water comprising:

a frame having a straight rigid top member for defining an opening for attachment to the mouth of a net;

buoyant aquaplanes attached to the frame at the sides of the top of said opening and extending forward and outward from said opening for maintaining the top of said opening at the surface of the water by buoyancy when the apparatus lies still in the water and by dynamic lift when the apparatus having a said net attached thereto is being towed;

paravanes attached to the frame at the sides of said opening and extending in a plane normal to the plane of the aquaplanes forward from said opening and beneath the aquaplanes for steering the apparatus when the apparatus is being towed;

an unbalanced bridle yoke attached to the paravanes for steering the apparatus obliquely to the direction in which the apparatus is being towed,

a tow line attached to the bridle yoke;

a weight attached to the tow line for maintaining the bridle yoke beneath said opening when the apparatus is being towed; and

a sheet attached to the top said opening and extending forward from said opening between the paravanes with the leading edge of the sheet being above the plane of the aquaplanes when the apparatus lies still in the water, whereby the sheet is held out of the water for deflecting toward said opening, splashing water and marine life that has moved above the water surface forward of said opening when the apparatus is being towed.

4,082,056

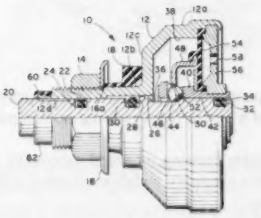
PRESSURE CHANGE INDICATOR

Dale F. German, Roxboro, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 658,427, Feb. 17, 1976, abandoned. This application Nov. 24, 1976, Ser. No. 744,677

Int. Cl.[2] B60C *23/04*

U.S. Cl. 116—34 R **5 Claims**



1. A device for indicating that the pressure in a pressurized container has dropped below a predetermined level, said device comprising:

(a) means defining a pressure sensing chamber including port means exposing said chamber to the pressure in said container, and sensing means movable in response to change in container pressure;

(b) indicator means movable with respect to said chamber defining means in response to movement of said sensing means and including engageable detent means;

(c) means biasing said sensing means in a direction opposing said container pressure such that said sensing means is moved by said bias means when container pressure is less than said predetermined level;

(d) releasable latch means operable to hold said indicator in a first position indicating pressure in said container of at least the said desired level, said latch means being operative, in response to the pressure in said container falling below said desired level, to release said indicator for movement to a second position indicating that the pressure level is below said predetermined level, said latch means including,

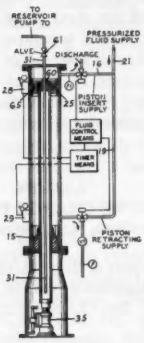
(i) at least one substantially spherical member adapted to engage said detent means for retaining said indicator means in said first position;

(ii) retaining means movable in response to movement of said sensing means and operable to retain said substantially spherical member in engagement with said detent means only when said container pressure is of at least said desired level.

4,082,057
APPARATUS FOR SPRAYING INTERIOR SURFACE OF VESSELS

Tom F. Hayes, La Porte, Tex., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Apr. 21, 1975, Ser. No. 569,880
Int. Cl.[2] B05C 7/02
U.S. Cl. 118—9 8 Claims



1. An apparatus for directing a liquid spray against the interior walls of a vessel from rotating nozzle means which comprises:

(a) a cylinder housing mounted externally on the vessel;

(b) a piston assembly slidably mounted within the cylinder housing;

(c) a fluid conduit one end of which is affixed to said piston assembly;

(d) annular lower cylinder housing seal means fixedly mounted within the cylinder housing surrounding the fluid conduit;

(e) a fluid delivery tube affixed to, and passing through the end of the cylinder housing opposite the vessel, and passing coaxially through the piston assembly and into the fluid conduit, and terminating at a point below the lowermost position of travel of the piston assembly; and

(f) annular seal means affixed to the piston assembly for slidably receiving the coaxial fluid delivery tube,

which elements (a) through (f) cooperate to provide pressure tight expandable chambers above and below the piston assembly; and

(g) upper cylinder conduit means with affiliated means for alternatively admitting and discharging a pressurized fluid into the cylinder housing above the piston assembly;

(h) lower cylinder conduit means with affiliated means for alternatively controllably discharging and admitting a pressurized fluid into the cylinder housing below the piston assembly;

(i) a source of pressurized fluid and means for alternatively delivering it to the upper and lower cylinder conduits to produce a movement of the piston in the direction of and away from the vessel responsive to the flow of the pressurized fluid;

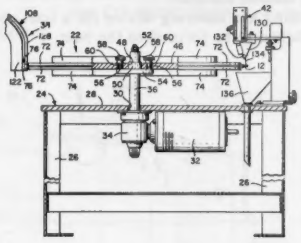
(j) rotating nozzle means mounted on the end of the fluid conduit opposite the piston assembly;

(k) a source of pressurized liquid and means for delivering it to the fluid delivery tube and to thereby activate the rotating nozzle means for spraying.

4,082,058
APPARATUS FOR PRODUCING LOCKING PATCHES ON MAGNETIC SCREWS

Hilmar K. Dieme, Westfield, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Dec. 30, 1975, Ser. No. 695,199
Int. Cl.[2] B05C 5/00
U.S. Cl. 118—319 12 Claims



1. Apparatus for producing locking patches of thermoplastic material on threaded portions of screws of magnetic material, said apparatus comprising:

(a) a dial assembly having an axis;

(b) means mounting said dial assembly with said axis vertical and for rotating said dial in a predetermined direction about said axis;

(c) means for delivering screws to the outer periphery of said dial assembly at a first circumferential location with respect to said dial assembly;

(d) screw heating means adjacent the outer periphery of said dial assembly at a second circumferential location with respect to said dial assembly;

(e) powder dispensing means adjacent the outer periphery of said dial assembly at a third circumferential location with respect to said dial assembly; and

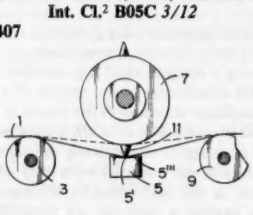
(f) screw stripper means adjacent the outer periphery of said dial assembly at a fourth circumferential location with respect to said dial assembly;

said dial assembly comprising a central disc of non-magnetic material affixed to said mounting and rotating means, and a plurality of similar, closely spaced permanent magnets extending radially outwardly from the outer periphery of said disc and in magnetic communication with the outer periphery of said dial assembly for magnetically holding screws thereagainst.

4,082,059
COATING APPARATUS WITH INTERMITTENT SUBSTRATE BACKUP

Donald B. McIntyre, and Frederic S. McIntyre, both of Wellesley Hills, Mass., assignors to Acumeter Laboratories, Inc., Newton Lower, Mass.

Division of Ser. No. 537,064, Dec. 30, 1974, Pat. No. 4,020,194.
This application Nov. 19, 1976, Ser. No. 743,324
Int. Cl.[2] B05C 3/12
U.S. Cl. 118—407 8 Claims



1. Fluid application apparatus having, in combination, means for longitudinally feeding a sheet along a predetermined path

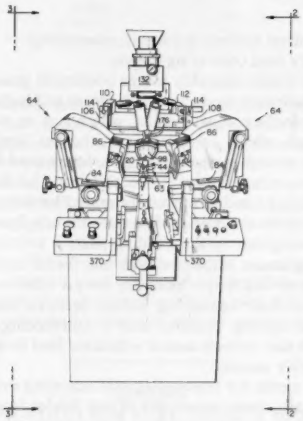
past a predetermined location spaced from said sheet at one side thereof, projection means at the opposite side of said sheet movable along a curved path about an axis transverse to and spaced from the path of said sheet, and spaced from said location along the direction of sheet movement, into engagement with said sheet for deflecting it substantially to said location, extrusion nozzle means at said location providing fluid contacted by the deflected sheet and having a wiping surface generally associated with said path of the projection means, and means for periodically moving said projection means along its path to deflect said sheet and cause fluid contacted by the deflected sheet to be wiped onto the sheet as a coating as the sheet travels along said wiping surface.

4,082,060

CEMENT SIDE AND HEEL LASTING MACHINE

Walter Vornberger, Tewksbury, Mass., and Karl F. Vornberger, Amherst, N.H., assignors to International Shoe Machine Corporation, Nashua, N.H.

Filed Jan. 26, 1977, Ser. No. 762,685
Int. Cl.[2] B05C *3/02, 11/00;* **A43D** *21/00*
U.S. Cl. 118—411 **9 Claims**



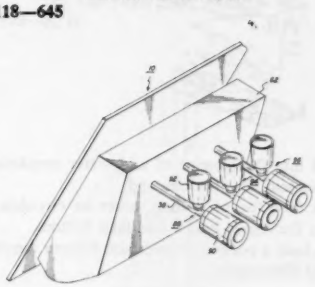
1. A machine, operable on a shoe assembly formed of a last having an insole located on its bottom and an upper mounted thereon with the toe portion of the upper margin being wiped against and secured to the insole and unwiped portions of the upper margin extending heelwardly of said wiped upper margin portion, for applying cement in the corners between said unwiped margin portions and the corresponding portions of the insole periphery comprising: a shoe assembly support for supporting the shoe assembly bottom-up with the toe end of the shoe assembly facing forwardly; a pair of nozzles, located above the shoe assembly, mounted for forward-rearward movement, for heightwise movement, and for inward-outward movement; a stop member located in a particular location; an engaging member, mounted for forward-rearward movement in unison with the nozzles, located rearwardly of the stop member in intersecting relationship with the stop member; means for initially retaining the nozzles in rearward, upper and inner positions; means for thereafter moving the nozzles, together with the engaging member, forwardly until the engaging member intersects the stop member; means for thereafter effecting lowering and outboard movements of the nozzles to move the nozzles into said corners heelwardly of the boundaries between said wiped and unwiped upper margin portions; means for thereafter removing the stop member from said particular location to enable the nozzles to resume their forward movement so as to bring the nozzles to said boundaries; means operative when the nozzles have arrived at said boundaries to effect rearward movement of the nozzles while maintaining the nozzles in said corners; and means for extruding cement from the nozzles into said corners during said rearward movements of the nozzles; the machine having the improvement comprising: a detector member mounted for forward-rearward movement; means so mounting the stop member and so connecting the stop member to the detector member as to cause the stop member to have forward-rearward movement in unison with the detector member; means for initially locating the detector member in a forward position that is forward of the toe end extremity of the shoe assembly; and means, operative prior to said first mentioned forward movement of the nozzles, for yieldably moving the detector member, together with the stop member, rearwardly to bring the detector member into engagement with the toe end extremity of the shoe assembly and to thereby bring the stop member to said particular location.

4,082,061

MULTI-COLOR DEVELOPMENT SYSTEM

Lawrence J. Fraser, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1977, Ser. No. 777,377
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—645 **10 Claims**



1. An apparatus for developing a latent image arranged to be recorded on a member with particles, including:
- a housing defining a chamber for storing a supply of particles therein;
- means, disposed in the chamber of said housing, for depositing particles on the latent image;
- means for storing a plurality of differently colored particles remotely from the chamber of said housing;
- means for cleaning the particles from the chamber of said housing;
- a plurality of conduits coupling said storing means with the chamber of said housing; and
- operator selectable means for advancing particles of a selected color from said storing means through one of said conduits to the chamber of said housing.

4,082,062

INTEGRATED AQUARIUM

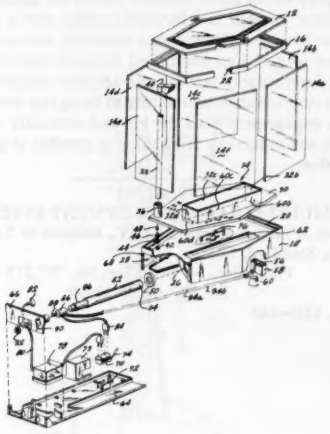
Donald J. Rodemeyer, City Island, N.Y., assignor to Metaframe Corporation, Elmwood Park, N.J.

Filed Jun. 22, 1976, Ser. No. 698,556
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—5 **7 Claims**

1. A frameless integrated aquarium comprising:
- a molded base defining a lower portion of a water containing region, said base being integrally provided with electrical means for heating, illuminating, and circulating the water contained in said water containing region;
- a plurality of transparent vertical side walls further defining said water containing region, said side walls being secured in part by integrally molded grooves provided as part of said molded base;
- a molded top frame having defined on the lower surfaces therof integrally molded grooves for further securing said side walls; and

a false bottom removably located at the lower portion of the water containing region defined by said base and said side walls, said false bottom comprising:

a vertically upstanding gravel barrier for permitting a light source located below said false bottom to project



light into the interior of said water containing region above said false bottom, and

a riser tube for permitting water to circulate upwards from the region below said false bottom,

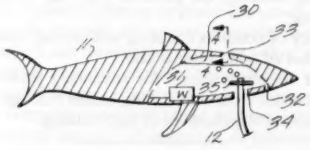
wherein at least a portion of said false bottom functions as an undergravel filter plate.

4,082,063

ALTERNATELY ASCENDING AND DESCENDING AQUATIC ARTICLE

Robert E. Strickland, 1965 S. Beverly Glen Blvd., West Los Angeles, Calif. 90025

Filed Aug. 23, 1976, Ser. No. 716,661
Int. Cl.[2] A01K *63/00;* **A63H** *23/10*
U.S. Cl. 119—5 **17 Claims**



14. An article of manufacture for use in a water container comprising:

a figure having a buoyancy chamber, the figure being heavier than water when the chamber is filled with water and lighter than water when the chamber is filled with gas;

a flexible tube having first and second ends;

a plurality of holes in the figure establishing communication between the chamber and the outside of the figure; and

a swivel connection means between the tube near the first end and the figure for permitting the figure to rotate relative to the tube, the first end of the tube opening into the chamber to establish communication between the first end of the tube and the plurality of holes;

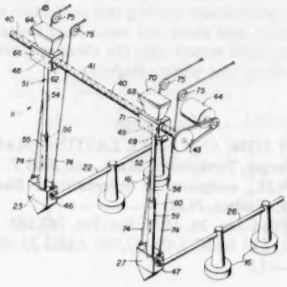
the second end of the tube being adapted to receive gas under pressure for conveyance through the tube to the chamber.

4,082,064

ANIMAL FEEDING APPARATUS

Alfred Turenne Newell, III, 324 Redwood St., Birmingham, Ala. 35210

Filed Nov. 26, 1975, Ser. No. 635,644
Int. Cl.[2] A01K *5/02, 39/00*
U.S. Cl. 119—51.11 **17 Claims**



1. An animal feeding apparatus, comprising:

stationary feed conveying means;

movable feeder assembly means positioned generally below said stationary feed conveying means and including one or more feeding pans each of which has an open portion through which animals can withdraw feed when said feeder assembly means is at a predetermined feeding position, receptacle means for receiving and holding feed, and conveying conduit means connected between said receptacle means and said feeding pans for supplying feed from said receptacle to said feeding pans;

actuating means connected with said feeder assembly means to move said feeder assembly means relative to said stationary feed conveying means between said predetermined feeding position and a non-feeding position at which said animals cannot withdraw feed from said feeder assembly means;

control means for controlling said actuating means to automatically cause movement of said feeder assembly means to said feeding position for a first predetermined period of time and then cause movement of said feeder assembly means to said non-feeding position for a second predetermined period of time;

movable conduit means of variable length connected between said stationary feed conveying means and said receptacle means to provide a feed passageway therebetween; and

auxiliary feed reservoir means distinct from such feedconveying passageway but connected to said stationary feed conveying means in alignment with said movable conduit means for receiving feed displaced in such passageway upon movement of said feeder assembly means between said feeding and non-feeding positions without significant compression of the feed within said conduit means, whereby a bonding together of the individual particles of the feed within said conduit means and a consequent clogging of the feed path there-through are precluded.

4,082,065

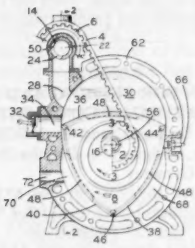
ROTARY INTERNAL COMBUSTION ENGINE

Ernest W. Baxter, 415 E. Main St., Van Wert, Ohio 45891

Filed Mar. 5, 1976, Ser. No. 664,142
Int. Cl.[2] F02B *53/06*
U.S. Cl. 123—219 **1 Claim**

1. In a rotary internal combustion engine of the Wankel type, a three-lobed rotor having spices turning through 360°, a shaft for mounting said rotor and effecting eccentric rotation during the 360° rotation of said three-lobed rotor, a figure-8-shaped

epitrochoidal chamber providing walls in which said rotor turns, the rotor apices of said rotor being in constant contact with said walls, a carburetor for the fuel supplied to said internal combustion engine and including a fuel intake port opening into said chamber to provide an air-fuel mixture which is supplied through said port opening serving as an inlet to said chamber, a carburetor valve means operative independently of said shaft to control the fuel-air flow into said chamber at an unrestricted flow rate downstream of said carburetor valve and with a flow rate and amount which is independent of the rotation of said shaft for mounting the rotor, a supplementary air intake port which is circumferentially spaced from the fuel intake port in the direction of rotation of said rotor and open-



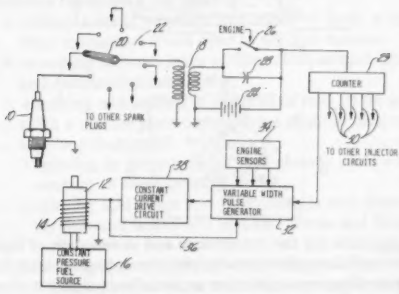
able and operable independently of the throttle opening effective at said fuel intake port, a rotary control valve for controlling said supplementary air intake port and movable at a speed controlled by the speed of said shaft, means driveably interconnecting said shaft and said rotary valve whereby said rotary valve is opened and closed in timed relation to the rotation of said rotor, and whereby an additional charge of air is inducted into the chamber during the intake stage while the engine is operating at throttle openings wherein vacuum develops within said chamber, such additional charge of air being available to obviate subatmospheric pressures each time an apex of said rotor passes said carburetor and air intake ports respectively.

4,082,066

MODULATION FOR FUEL DENSITY IN FUEL INJECTION SYSTEM

E. David Long, Elmira, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed May 3, 1976, Ser. No. 682,701
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **15 Claims**



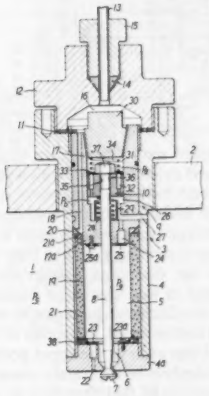
1. In a fuel injection system for an internal combustion spark ignited engine including a source of fuel, at least one injector connected to the fuel source, said injector having an electric coil and being electrically controllable, means for measuring engine operating parameters, and means for controlling the injector to provide the engine with volumes of fuel which vary as a function of the measurements of the operating parameters the improvement comprising: means for generating an electrical signal proportional to the resistance of said coil for measuring the temperature of the fuel adjacent to the injector; means for generating variable width electrical pulses in timed relation to the operation of the engine for controlling the injector to vary the volume of fuel provided to the engine as a function of the output of said means for measuring engine operating parameters; and means for controlling the injector to modify the volume of fuel provided to the engine as a direct function of the output of said means for measuring the fuel temperature adjacent to the injector, whereby the weight of fuel provided to the engine is maintained independent of fuel density changes resulting from fuel temperature variation.

4,082,067

AUTOMATIC FUEL HEATING INJECTION VALVE

Shigeru Yanagihara, Kodaira, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 26, 1976, Ser. No. 735,254
Int. Cl.[2] F02B *3/00*; F02M *49/02*
U.S. Cl. 123—32 H **13 Claims**



1. An automatic fuel heating and injection valve assembly comprising:

a generally cylindrical casing capable of being mounted fixedly in heat exchange relationship on a combustion chamber of an internal combustion engine and having an inner end capable of being disposed in said combustion chamber;

a fuel injecting port provided at said inner end of said casing;

an evaporating chamber defined in said casing contiguous to said inner end and communicable with said combustion chamber through said fuel injecting port such that heat is exchanged from said combustion chamber to said evaporating chamber by way of said cylindrical casing to aid in fuel evaporation;

an actuator mounted in said casing on the outer side of said evaporating chamber and operative in response to pressure variations in said combustion chamber;

a valve mounted in said fuel injecting port and having a stem connected to said actuator to open and close said fuel injecting port in response to said pressure variations in said combustion chamber;

a fuel chamber provided in said casing on the outer side of said actuator and communicating with a pressurized fuel source through a fuel feeding conduit; and

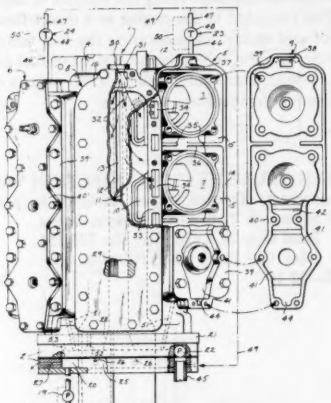
a fuel passage provided axially through said actuator and communicating said fuel chamber with said evaporating chamber.

4,082,068

V-ENGINE COOLING SYSTEM PARTICULARLY FOR OUTBOARD MOTORS AND THE LIKE

David Jerry Hale, Pickett, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 4, 1975, Ser. No. 610,306
Int. Cl.² F01P *7/00, 7/12*
U.S. Cl. 123—41.02 **18 Claims**



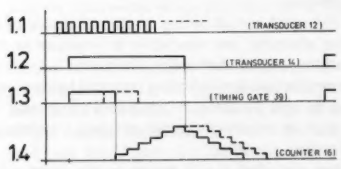
1. In an outboard motor having an engine with a pair of vertically arranged cylinder banks with a pair of parallel cooling water chambers between a common water inlet passageway means at the lower end of the cylinder banks and a common water discharge passageway means at the lower end of the cylinder banks providing a cooling flow upwardly and then downwardly to the discharge passageway means, pressure relief valve means in said discharge passageway means and selected to hold the discharge passageway means closed below a predetermined engine speed, and a pair of thermostatic valve means connected one each to the upper portion of each of said water cooling chambers to separately control water exit from the upper end portion of said chambers at idle.

4,082,069

METHOD AND APPARATUS TO DETERMINE THE TIMING OF CYCLICALLY REPETITIVE EVENTS, PARTICULARLY IGNITION INSTANT FOR INTERNAL COMBUSTION ENGINES

Hartmut Mayer, Aidlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 24, 1976, Ser. No. 660,858
Claims priority, application Germany, Mar. 20, 1975, 2512166
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 D **18 Claims**



1. Method to determine the timing of the ignition instant with respect to cyclical operation of a movable part of an internal combustion engine, in dependence on engine speed, comprising the steps of

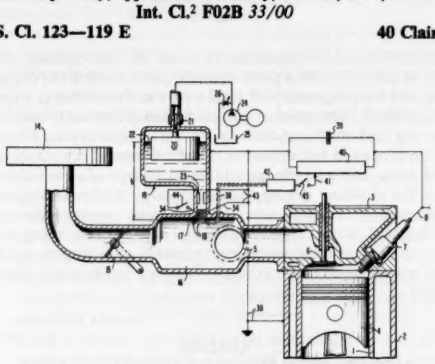
generating a sequence of pulses as a function of movement of, and synchronously with operation of the engine part;
generating a first reference pulse upon occurrence of a predetermined position of the engine part;
determining a timing interval having a predetermined timing duration upon generation of the first reference pulse;
generating a second reference pulse occurring after said first reference pulse, and after said timing interval;
counting the pulses of the pulse sequence after termination of the timing pulse and until occurrence of said second reference pulse, and accumulating said count in a counter (16);
decrementing the count in the counter until the count state of the counter (16) has reached a predetermined level;
and generating an output signal when the count state of said counter has reached said predetermined level.

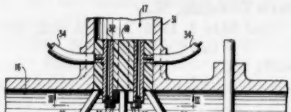
4,082,070

INSTALLATION FOR FEEDING AND ATOMIZING LIQUID, ESPECIALLY COMBUSTION FUEL

Helmut Säufferer, Esslingen, and Karl Willmann, Aichwald, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Oct. 16, 1975, Ser. No. 623,051
Claims priority, application Germany, Oct. 19, 1974, 2449848
Int. Cl.² F02B *33/00*
U.S. Cl. 123—119 E **40 Claims**





28. Apparatus for the conveyance and atomization of liquid fuel for internal combustion engines, the apparatus including means providing an outlet cross section directed into a chamber exposed to the flow of intake air and being delimited by an electrically conductive material, pressure means providing a conveying pressure for the liquid, fluid-dynamic conduit means for connecting the outlet cross section means and the pressure means, electrode means arranged at a predetermined distance in front of the outlet cross section means, the outlet cross section means having the boundary edges thereof electri-

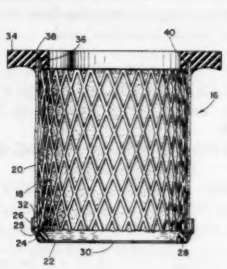
cally insulated at least with respect to the electrode means and constructed narrower with respect to other electrically conductive portions of the outlet cross section means, the boundary edges of the outlet cross section means projecting with respect to other electrically conductive portions of the outlet cross section means in the immediate vicinity of the outlet cross section means in a direction toward the electrode means, means for applying a potential difference between the outlet cross section means and the electrode means during the atomizing period whereby liquid fuel discharged from the outlet cross section means is atomized, the outlet cross section means being formed of a plurality of atomizing nozzle means and at least one nozzle means of the plurality of atomizing nozzle means being electrically insulated with respect to the other of the plurality of atomizing nozzle means, and selective means for one of electrically connecting the at least one nozzle means to the electric potential of the other of the plurality of nozzle means and electrically separating the first nozzle means from the other of the plurality of nozzle means independently of the potential difference between the other of the plurality of nozzle means and the electrode means.

4,082,071

ENGINE VENT VAPOR FILTER AND METHOD OF CONSTRUCTING SAME

Oscar F. Jones, P.O. Box 495, Salina, Okla. 74365

Filed Feb. 20, 1976, Ser. No. 659,694
Int. Cl.² F02B *33/00*; B23P *15/16*
U.S. Cl. 123—119 B **4 Claims**



1. In a volumetrically controlled cranckcase ventilation system for internal combustion engines, including a support and cover structure, a container for collecting liquid and solid particles which is sealed at its open end to said support and cover structure, a filter cartridge for retaining small particles, and a control valve, the method of construction of said filter cartridge comprising the steps of:

a. rolling a sheet of perforated metal to form a relatively rigid cylindrical frame open at top and bottom;
b. wrapping an outer layer of filter cloth around said frame, and coextensive therewith;
c. attaching and sealing to one end of said frame and filter cloth a closure plate comprising a shallow dish; comprising the sub-steps of;
   1. placing in the corner of said closure plate a selected amount of thermosetting liquid;
   2. placing said frame and filter cloth in said closure plate so that said liquid will wet said frame and filter cloth; and
   3. heating the assembly of said frame and filter cloth and closure plate to cause said thermosetting liquid to set;
d. forming a molded support and sealing flange at the second end of said frame, of thermosetting material, so as to seal and surround the ends of said frame and filter cloth, and to form a substantially rigid flange; whereby said flange is adapted to be clamped and sealed to said support and cover structure to support said cartridge; comprising the sub steps of;
   1. forming a mold cavity of outer diameter greatr than that of said frame and filter cloth;
   2. inserting into said cavity a selected volume of a selected liquid thermosetting compound;
   3. placing the second end of said frame and filter cloth into said liquid in said cavity; and
   4. heating the assembly to cause said thermosetting liquid to set;

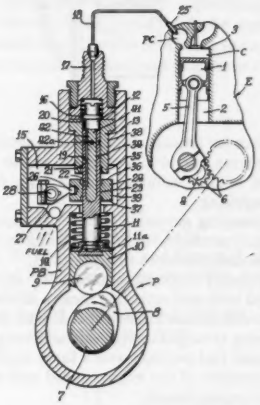
whereby said molded material not only seals the end of said frame and filter cloth, but forms a flange, which is the structural means to support and seal said filter cartridge to said support and cover structure.

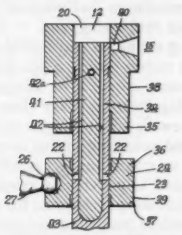
4,082,072

SEALING IN FUEL INJECTION PUMPS

Lloyd E. Johnson, 700 Highview Rd., East Peoria, Ill. 61611

Continuation of Ser. No. 558,639, Mar. 17, 1975, abandoned.
This application Jun. 7, 1976, Ser. No. 693,189
Int. Cl.² F02M *59/02*
U.S. Cl. 123—139 AA **20 Claims**





1. In a fuel injection pump for an internal combustion engine, which pump comprises a pump body defining a fuel supply space within which is a relatively low fluid pressure, a fixed cylinder member in said body and having a cylinder chamber, a plunger in that cylinder chamber, precision fitted with a close working clearance to the cylinder member and having a portion external to said cylinder member, a sleeve member in said space, separate from said cylinder member and having a cylindrical chamber within which said portion of said plunger is positioned, said sleeve member being similarly fitted on said portion of the plunger, said plunger being formed about an axis and having a concentric axial bore therein, said plunger reciprocating axially with respect to said members, said plunger having porting means arranged to be closed by reciprocation of the plunger relative to the members, the improvement comprising:

said bore in said plunger having a diameter not less than

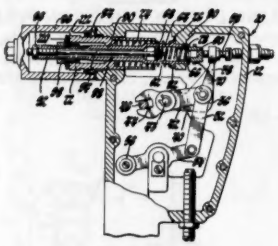
one-half nor more than seven-tenths of the outer diameter of said plunger, whereby pressurization in the bore expands the plunger to reduce the clearance between it and the members.

4,082,073

ENGINE SPEED GOVERNOR WITH IMPROVED PEAK LOAD CONTROL

Richard L. Balogh, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 16, 1976, Ser. No. 696,585
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—140 R **8 Claims**



1. A governor for limiting the maximum speed of an internal combustion engine operable at varying speeds and loads and having a fuel control actuator for varying fuel input, said governor comprising

a housing carrying actuating means connectable with such fuel control actuator, said means being movable between maximum and minimum fuel positions,

centrifugal speed responsive means in said housing and connected with said actuating means, at least during operation above a predetermined speed, said speed responsive means being arranged to urge said actuating means toward its minimum fuel position with a force varying as an exponential function of the engine speed and increasing with increased engine speed,

a first spring in said housing and biasing said actuating means toward its maximum fuel position over the full range of travel of said first spring, and

a second spring acting on said actuating means in opposition to said first spring during a portion of the travel of said actuating means adjacent its maximum fuel position, said second spring being weaker than said first spring and acting therewith to provide a reduced spring rate for travel of said actuating means over said portion of such travel near its maximum fuel position, said second spring being designed to provide, in combination with said first spring, a decreasing spring rate for travel of said actuating means toward its maximum fuel position in said portion of such travel near its maximum fuel position, said decreasing spring rate being matched to partially offset the increase of force with increased speed of said centrifugal speed responsive means such that movement of said actuating means during said portion of travel near its maximum fuel position equals a substantially constant function of the change in engine speed during said portion of travel.

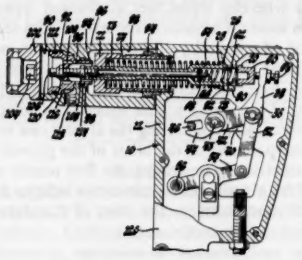
4,082,074

MECHANICAL ENGINE GOVERNOR WITH VARIABLE LIMITING SPEED SETTING

Edward D. Baugh, Union Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 28, 1976, Ser. No. 700,292
Int. Cl.[2] F02D *1/12*
U.S. Cl. 123—140 FG **6 Claims**

1. The combination of an engine governor of the type wherein a speed setting spring has one end fixed in a housing and another operative end effectively engaging and movable with fuel control means connected with speed responsive means that increasingly urge the fuel control means in a fuel decreasing direction as engine speed is increased, said spring being preloaded and yieldable above a predetermined force to permit fuel decreasing movement of the fuel control by the speed responsive means so as to control engine speed at a predetermined setting, and the improvement comprising: a



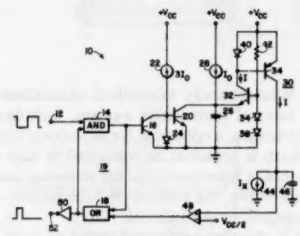
speed adjuster effecive to controllably bias the operative end of the speed setting spring in a direction opposite to its preload force, said adjuster having a force applying element movable with and capable of acting upon the operative end of the spring and of being adjustably biased in relation to the housing to variably oppose the preload force of the spring on the speed responsive means, thereby variably and controllably reducing the effective speed setting of the governor.

4,082,075

INPUT QUARTER CYCLE TIMING CIRCUIT

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1976, Ser. No. 662,052
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 E **14 Claims**



1. A timing circuit for producing an output signal the time duration thereof being a predetermined percentage of the period of an applied input signal, comprising:

capacitive means having first and second electrodes with said second electrode being connected to a ground reference terminal;

first circuit means coupled to said first electrode of said capacitive means for charging said capacitive means at a predetermined rate during a portion of the applied input signal;

second circuit means coupled to said first electrode of said capacitive means and the input of the timing circuit for discharging said capacitive means at a predetermined rate during another portion of the applied input signal including latch circuit means adapted to receive the input signal for producing first and second portions of a control signal corresponding to first and second time periods of the input signal, and switching circuit means responsive to said first portion of said control signal for discharging said capaci-

tive means, said switching circuit means being responsive to said second portion of control signal to cause said capacitive means to be charged by said first circuit means;

third circuit means coupled to said first electrode of said capacitive means and to said second circuit means for producing the output signal only during the time that said capacitive means is being discharged;

said second circuit means further including:

a. first electron control means having first, second and control electrodes, said first electrode being connected to said ground reference terminal, said control electrode being coupled to said latch circuit means;

b. second electron control means having first and second electrodes, said first electrode being connected to said ground reference terminal, said second electrode being coupled to said second electrode of said first electron control means;

c. third electron control means having first, second and control electrodes, said first electrode being coupled to said ground reference terminal, said control electrode being coupled to said second electrode of said first electron control means, and said second electrode being connected to said first electrode of said capacitive means;

d. first constant current source means coupled to said second electrode of said first electron control means for supplying a first current of a predetermined magnitude; and

e. said second electron control means being rendered nonconductive by said second portion of said input control signal from said latch circuit means such that said capacitive means is charged by said first constant current source means and said second electron control means being rendered conductive in response to said first portion of said input control signal from said latch means such that said capacitive means is discharged at said second predetermined rate.

4,082,076

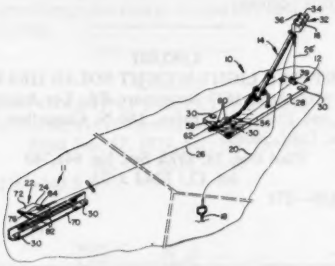
SPRING TYPE BALL-PITCHING APPARATUS

Jack A. Perry, Box 294, McCamey, Tex. 79752

Filed May 20, 1976, Ser. No. 688,128

Int. Cl.[2] F41B *3/02*

U.S. Cl. 124—7 **6 Claims**



1. Ball pitching apparatus comprising a base, means for releasably supporting a baseball, an arm having opposed ends, a pitching spring, and an arresting spring;

a journal formed on a medial portion of said arm in spaced relation to said opposed ends thereof to thereby present an upper marginal end and a lower marginal end; mount means by which said journal is supported at an elevation above said base to thereby permit said arm to be pivotally mounted in spaced relationship respective to said base such that each of the opposed marginal ends pivot about a common pivot point;

said means for releasably supporting a baseball being affixed to said upper marginal end of said arm; said arresting spring having opposed ends with one end thereof being directly connected to said lower marginal end portion of said arm;

said pitching spring having opposed ends with one end thereof being connected to upper marginal end of said arm at a location between said mount means and said means for releasably supporting a baseball;

the other end of said pitching and arresting springs extend away from said arm, towards one another, and towards a common end of said base;

pitching spring and arresting spring tension adjustable fastener means having one common anchor point to which said other ends of said pitching and arresting springs are anchored to said common end of said base;

said springs jointly cooperating with said adjustable fastener means to normally bias said arm into a position of rest with the arm being positioned forwardly of a rearward position, whereupon said arm can be forced into a rearward position to store energy in said pitching spring, and when said arm is released said pitching spring accelerates said means for releasably supporting a baseball in a forward direction, while said arresting spring arrests said arm before said means for releasably supporting a baseball approaches the end of its travel, with the arresting force being progressively applied to decelerate the arm until the arm reverses its path of travel and returns to said position of rest.

4,082,077

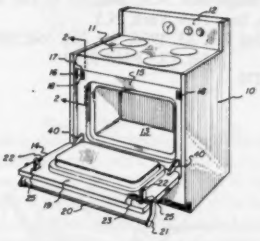
OVEN DOOR LATCH

Anil C. Marfatia, Brooklyn Center, and George A. Jarvis, Minneapolis, both of Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jul. 22, 1976, Ser. No. 707,863

Int. Cl.[2] F23M *7/00*

U.S. Cl. 126—197 **7 Claims**

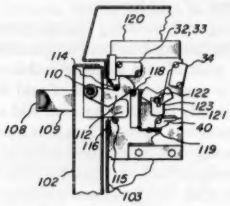


1. A door latching and locking mechanism for a combination cooking appliance of the type adapted to cook foods with both thermal and microwave energy in a single oven cavity, said mechanism comprising an elongated rod member rotatably mounted in the oven door, said rod member oriented generally horizontally across the width of said door; handle means including end portions, said handle oriented generally horizontally across the width of said door and spaced away therefrom by said end portions, said end portions being fastened to the respective ends of said rod member; latch catch means mounted on said rod member and extending through the inside face of said door; latch engaging means mounted within the body of said appliance positioned adjacent said latch catch means when said door is in a closed position, wereby said latch catch means rotates into engagement with said latch engaging means to lock said door into a closed position as said handle means is rotated about the longitudinal axis of said rod member.

4,082,078
PYROLYTIC LOCK ASSEMBLY

Richard A. Thuleen, Minneapolis, and John E. Richard, Buffalo, both of Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 6, 1976, Ser. No. 730,229
Int. Cl.[2] F23M 7/00; E05C 3/02
U.S. Cl. 126—197 5 Claims



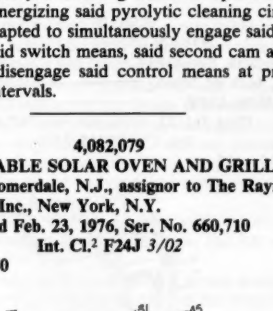
1. A locking mechanism for a domestic cooking appliance having a pyrolytic cleaning circuit, said appliance having a door, said door including a movable handle portion with latch elements; said appliance having means for receiving and engaging said latch elements when said door is closed, said mechanism comprising:

first and second cams mounted for rotation on a common shaft; means for rotating said cams; means for control of said rotating means; a lock element positionable to prevent movement of said latch elements and opening of said door during a pyrolytic cleaning mode of operation; switch means for energizing said pyrolytic cleaning circuit; said first cam adapted to simultaneously engage said lock element and said switch means, said second cam adapted to engage or disengage said control means at preselected rotational intervals.

4,082,079
PORTABLE SOLAR OVEN AND GRILL

John Rodgers, Somerdale, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,710
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 1 Claim



1. An oven adaptable for utilization of solar energy for heating purposes, comprising

an open box, the side walls and bottom wall of which bound a central heating chamber covered by a pane of glass, with the interior faces of the walls coated with a black finish, with one of said walls including a through slot therein to, together with

a grill plate slidably mounted in said box adjacent said through slot of a size to slide through said slot, with

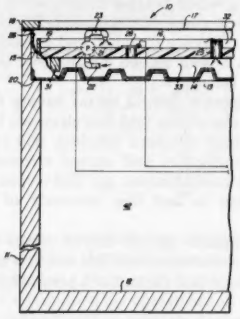
means to heat said grill plate when the grill plate is partially extended through said slot so as to grill food on the portion of the grill plate lying exterior of the heating chamber,

said means comprising a metal plate hinged to the interior of the box which rests on a section of the grill plate that lies within the box so as to heat the grill plate and the section of the grill plate extended beyond the confines of the box by solar energy falling on the hinged plate.

4,082,080
ENERGY ROOF

A. Lincoln Pittinger, 62 Colonia Miramonte, Scottsdale, Ariz. 85253

Division of Ser. No. 575,145, May 6, 1975, Pat. No. 3,994,278.
This application Aug. 13, 1976, Ser. No. 714,252
Int. Cl.[2] F24J 3/02; F28D 19/00
U.S. Cl. 126—271 5 Claims



1. A method for controlling heat exchange between the universe and an enclosure constructed to support in a first portion a quantity of liquid oriented in a place of minimal exposure to solar radiation and in a second portion a quantity of liquid oriented in a place to receive a greater exposure to solar radiation, said portions separated by a member common to each portion, the steps comprising:

positioning during a period of the diurnal temperature cycle the major quantity of the liquid of said first and second portions in said first portion, and

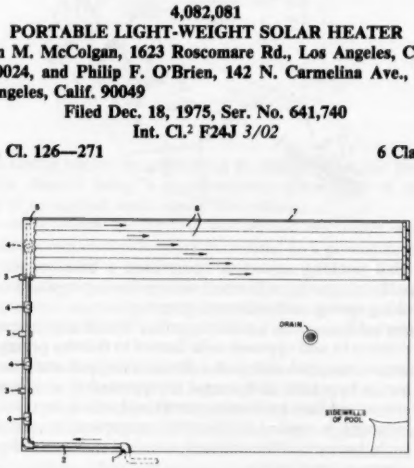
positioning during a second period of said temperature cycle said major quantity of the liquid in said second portion,

said common member being floatable on the liquid in said first portion and movable vertically to vary the volume of said first portion.

4,082,081
PORTABLE LIGHT-WEIGHT SOLAR HEATER

John M. McColgan, 1623 Roscomare Rd., Los Angeles, Calif. 90024, and Philip F. O'Brien, 142 N. Carmelina Ave., Los Angeles, Calif. 90049

Filed Dec. 18, 1975, Ser. No. 641,740
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 6 Claims



1. A flat plate solar energy collector assembly adapted to float on the water surface of a pool, comprising a relatively

thin flexible cellular plastic sheet floating upon and insulating the surface of the pool, a plurality of parallel flexible thin plastic tubes extending over substantially the entire area of the floating plastic sheet, means securing said tubes to the top surface of the floating sheet, entry means provided at one end of said tubes, exit means provided at the other end of said tubes, said exit means from said tubes being relatively large in comparison to the entry means for said tubes and means for pumping the pool water into said entry means and through said thin flexible plastic tubes during hours of exposure to sunlight.

4,082,082

SOLAR ENERGY COLLECTOR

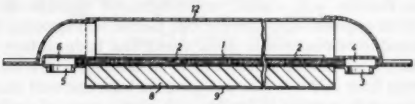
Lawrence Harvey, Coldharbour, near Dorking, England, assignor to The British Petroleum Company Limited, London, England

Filed Aug. 6, 1976, Ser. No. 712,278

Claims priority, application United Kingdom, Aug. 19, 1975, 34398/75

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **6 Claims**



1. A solar energy collector comprising a heat collecting zone which comprises an integrally formed strip including a plurality of parallel, transparent tubes, said tubes being made from a resin selected from the group consisting of polyvinyl chloride, polysulphone and polycarbonate, inlet means communicating with one end of said tubes and outlet means communicating with the opposite end of said tubes for supplying a heat conveying fluid to, and removing said fluid from, said tubes, an energy absorbing particulate or fibrous material substantially filling said tubes but loosely packed so as to permit said fluid to flow through said tubes, said energy absorbing material having a density in the range from 0.9 to 1.0 and a thermal diffusivity below 2.5×10^{-3} cm^2/sec. at temperatures above 20° centrigrade, and an energy transparent cover over one side of said strip for permitting solar energy to pass through said cover and enter said tubes.

4,082,083

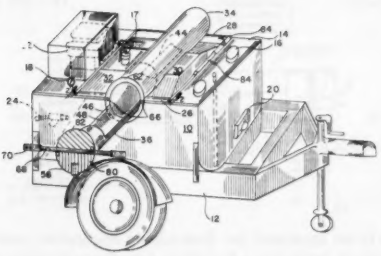
NON-POLLUTING TAR KETTLE ASSEMBLY

Monroe D. Horne, 4161 Cherokee Ave., San Diego, Calif. 92104

Filed Jan. 17, 1977, Ser. No. 759,818

Int. Cl.[2] E01C *19/45*

U.S. Cl. 126—343.5 A **8 Claims**



1. An improved tar kettle assembly, comprising:

a. a tar-receiving kettle having heating means, tar temperature sensing and control means and hot liquid tar pump-out means;

b. a safety loader, for charging solid asphalt into said kettle, comprising:

1. a closure panel closing the top of said kettle, said panel having a lid portion;
2. a hollow fixed cylinder integrated with the top of said lid portion, the lower part of said cylinder and the adjacent part of said lid portion having a common opening therein communicating with the interior of the kettle;
3. a charger cylinder telescopically and reasonably snugly mounted in said fixed cylinder and being essentially a hollow cylinder having a cut-away portion intermediate the length thereof to permit lading asphalt thereinto when the charger cylinder is extended, and said cut-away portion being functional as a discharge opening communicating with said opening in the lower part of the fixed cylinder, the ends of the cut-away portion being closed so that, when extended as well as when telescoped into said fixed cylinder and rotated to discharging position, said charger cylinder effectively closes said opening in the fixed cylinder;
4. and means for manipulating said charger cylinder.

4,082,084

PORTABLE DIAGNOSTIC DEVICE

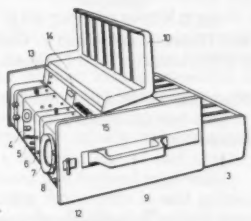
Ervin Lipscher, Budapest, Hungary, assignor to Medicor Muvek, Budapest, Hungary

Filed Jan. 22, 1976, Ser. No. 651,599

Claims priority, application Hungary, Jan. 31, 1975, ME 1832

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 D **2 Claims**



1. A portable diagnostic device, particularly for medical field examinations, comprising a portable carrying case having a handle thereon for carrying the case, and in the case a plurality of replaceable electronic examining units for the examination of different physiological functions and/or conditions, an electronic power supply in the case for feeding each of the electronic examining units, a common display carried by the case receiving output signals of the examining units, electrical connectors providing electrical connections between electrical circuits in the case and electrical circuits in the examining units, the interior of the case comprising at least two separated spaces, a first said space accommodating all of the electronic examining units, a second said space accommodating accessories for the examination, there being at least four said electronic examining units in said first space, a portion of the outside of said portable carrying case being comprised by an L-shaped lid mounted for swinging movement on and relative to said case between a raised position in which said lid rests on said case and a closed position in which said lid closes said first space within said case, said lid in said closed position overlying said examining units, each said examining unit having an L-shaped face plate defining the upper side and the front of said unit, there being an upright front plate between said upper sides of said examining units and the axis of swinging movement of said lid on said case.

4,082,085

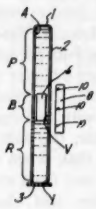
BLOOD CONSTITUENT TESTING METHODS

Stephen Clark Wardlaw, 16 Pine Orchard Rd., Branford, Conn. 06405; Robert Aaron Levine, 31 Pilgrim La., Guilford, Conn. 06437, and James Vincent Massey, III, 80 Driftwood La., Trumbull, Conn. 06610

Division of Ser. No. 673,058, Apr. 2, 1976, Pat. No. 4,027,660. This application Sep. 20, 1976, Ser. No. 724,563

Int. Cl.[2] A61B 5/14

U.S. Cl. 128—2 G 3 Claims



1. A method of determining the approximate volume of the buffy layer in a sample of anticoagulated whole blood comprising the steps of drawing the sample of blood into a capillary tube of constant diameter; centrifuging the drawn sample in the capillary tube to separate the red cells, buffy layer, and plasma gravimetrically into distinct layers; expanding the buffy layer axially of the tube at least about four fold; and measuring the distance between the upper and lower menisci of the buffy layer while the sample remains in the tube to provide a general indication of whether the white cell and platelet count is high, low, or normal.

4,082,086

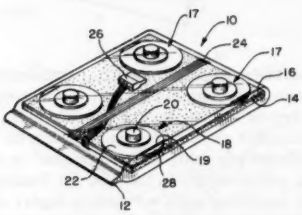
ECG MONITORING PAD

Dennis M. Page, Hinsdale, and Albert J. Bevilacqua, Downers Grove, both of Ill., assignors to M I Systems, Inc., Westmont, Ill.

Filed Dec. 13, 1976, Ser. No. 749,796

Int. Cl.[2] A61B 5/04

U.S. Cl. 128—2.06 E 13 Claims



1. An ECG monitoring device comprising: a first resilient sponge-like sheet, a second resilient sponge-like sheet adhesively attached to said first sheet layered relation and having a plurality of openings formed therethrough, and a plurality of electrode assemblies mounted to said second sheet in overlying relation to each of said openings, each said electrode assembly comprising: a base section having an adhesively coated surface on one side thereof, conductive terminal means carried by said base section and including a portion thereof corresponding to each side of said base section, a pre-gelled, sponge-like pad overlying a first portion of said terminal means on the adhesively coated side of said base section, a second portion of said terminal means on the opposite side of said base section being disposed in an associated opening in said second sheet, removable cover means forming part of each said electrode assembly overlying said adhesive surface on said base section and said pre-gelled pad; and a lead wire connected to each of said second terminal portions and extending between said sheets to the exterior thereof.

4,082,087

BODY CONTACT ELECTRODE STRUCTURE FOR DERIVING ELECTRICAL SIGNALS DUE TO PHYSIOLOGICAL ACTIVITY

David C. Howson, Trumansburg, N.Y., assignor to Isis Medical Instruments, Minneapolis, Minn.

Filed Feb. 7, 1977, Ser. No. 766,836

Int. Cl.[2] A61B 5/04

U.S. Cl. 128—2.06 E 11 Claims

1. For use with apparatus for deriving electrical signals associated with physiological activity, an electrode structure for deriving said signals when disposed upon a body surface, said electrode structure comprising a unitary body of moldable, flexible, soft, elastic, non-conductive material having faces on opposite sides thereof, one face of said opposite faces adapted to be disposed in contact with said body surface, said unitary body having at least one blind opening which extends therein from said one face and forms at least one well therein, an electrode member of flexible, soft, elastic material similar to the material of said unitary body disposed within said unitary body at the bottom of said well, said well being adapted to receive conductive jelly which is disposed in contact with said electrode member, and conductor means connected to the said electrode member for carrying said signals from said electrode member to said apparatus.

4,082,088

APPARATUS FOR DETERMINATION OF RESPIRATORY PASSAGEWAY RESISTANCE

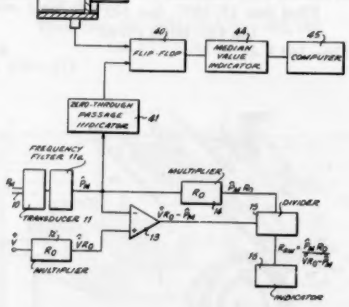
Manfred Franetzki, Erlangen; Volker Korn, Nuremberg, and Karl Prestele, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 559,872, Mar. 19, 1975, abandoned. This application Dec. 7, 1976, Ser. No. 748,385

Claims priority, application Germany, Mar. 22, 1974, 2414019; France, Nov. 28, 1974, 74 38993

Int. Cl.[2] A61B 5/08

U.S. Cl. 128—2.08 14 Claims



1. In an apparatus for determining respiratory passageway resistance, including a breathing tube for conveying a breath flow; a flow resistance in said breathing tube, a pulse generator for subjecting said breath flow to high frequencied pressure and, respectively, flow pulsations; and pressure measuring means comprising a mechanical-electrical transducer for mea-

suring the pressure in said breathing tube, the improvement comprising: an electrical frequency filter connected to said mechanical-electrical transducer for detecting the alternating pressure in said breath flow received by said transducer, said frequency filter being correlated to said pulsating frequency of said pulse generator; and an electronic computer circuit having multiplying, dividing and subtracting elements being connected to the output of said frequency filter, said computer circuit mathematically computing the respiratory passageway resistance R_{aw} from the measured alternating pressure P_M, the predetermined resistace value R_o of the flow resistance, and the predetermined flow pulsations ν of the pulse generator, in accordance with the relationship

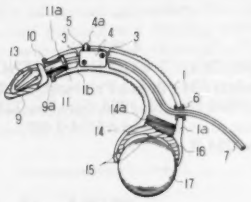
$$R_{aw} = \frac{P_M R_o}{\dot{\nu} R_o - P_M}.$$

4,082,089

MASSAGING INSTRUMENT AND A MASSAGING ASSEMBLY

Hisa Moriyama, and Toshiyuki Moriyama, both of Nouman 1531, Ichihara-shi, Chiba-ken, Japan

Filed Nov. 8, 1976, Ser. No. 739,737
Int. Cl.² A61H *29/00*
U.S. Cl. 128—24.3 **4 Claims**



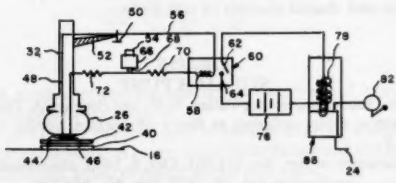
1. A massaging instrument comprising a grippable support member, a first massaging part which is supported by said member and heated to give hot thermal stimulation to human skins, and a second massaging part which is supported by said member and cooled to give cold thermal stimulation to human skins, wherein said member has a permanent magnet and said second massaging part is composed of a magnetic material, whereby said second massaging part is detachably mounted to said member.

4,082,090

MECHANICAL CARDIAC RESUSCITATOR

Roy Major Harrigan, Bromley Mountain Rd., Manchester, Vt. 05254

Filed Jan. 26, 1977, Ser. No. 762,499
Int. Cl.² A61H *7/00*
U.S. Cl. 128—51 **10 Claims**



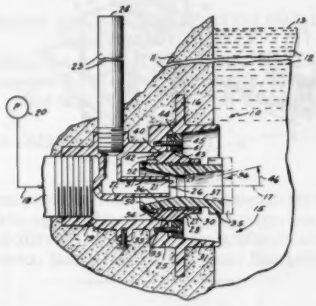
1. Apparatus for mechanical resuscitation which comprises: a plunger, means for driving said plunger between upward and downward positions, means for defining a predetermined region of an associated human torso to which a cyclical force is to be applied, and means for controlling said resuscitation apparatus responsive to impact of said plunger on said predetermined area or the lack of impact on said predetermined area.

4,082,091

HYDRO-AIR FITTING

Alfred Raab, Willowdale, Canada, assignor to Jacuzzi Bros., Inc.

Filed Dec. 22, 1976, Ser. No. 753,450
Int. Cl.² A61H *9/00*
U.S. Cl. 128—66 **6 Claims**



1. In a hydrotherapy nozzle assembly for controlling and directing a flow of aerated water, the assembly comprising a housing forming an axial flow passage for a stream of pressurized water, a tubular air means forming a radially extending air port at the axis of the passage, an externally threaded nozzle member extending downstream of said air port, an internally threaded ball member mounting said nozzle member for movement along and for universal swiveling movement about said axis, and the ball member having respective rearward and forward spherical surfaces, the improvement of a ball socket means and nozzle retention means comprising:

a groove portion of radially reduced outside diameter formed on a rearward end of said nozzle member and having rearward and forward axial walls;

an O-ring member receiveable in said groove portion for retention thereby and extending radially outwardly of the threads on the nozzle member;

a circumferentially extending abutment surface formed in said ball member axially adjacent said internal threads thereof and spaced radially to engage a forward side of said O-ring member;

a spherical socket portion formed in said housing to receive said rearward surface of said ball member; and

a one-piece sealing and retention member received circumferentially about said forward spherical surface of the ball member and secured removably in the housing to retain the ball member swivelably in a selected axial position.

4,082,092

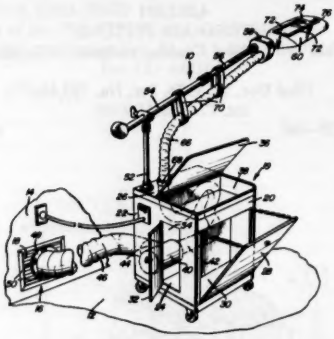
VACUUM CABINET AND GAS VENTING SHIELD

Beatrice D. Foster, 21496 H.C.L. Jackson Dr., Grosse Ile, Mich. 48138

Filed May 11, 1976, Ser. No. 685,169
Int. Cl.² A61B *19/00*
U.S. Cl. 128—139 **3 Claims**

1. In combination with an operating room enclosure defined within the confines of upstanding perimeter wall means, a gas diverting shield disposed within said operating room enclosure and comprising a generally horizontal panel structure defining a shallow downwardly opening cavity, a source of vacuum, passage means communicating said source of vacuum with said cavity, a lower portion of said wall means having an exhaust

vent opening formed therethrough, said passage means including an outlet end portion registered with a portion, only, of said vent opening, said vent opening comprising the inlet for a blower actuated exhaust system for said operating room enclo-



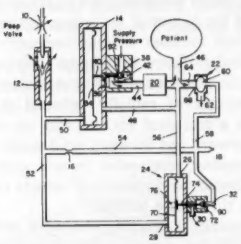
sure, said vent opening including a ferrous foraminated cover thereover, said outlet end portion of said passage means including magnetic attaching means supported therefrom magnetically attaching said outlet end portion to said cover.

4,082,093

COMPENSATOR VALVE

Stanley Eugene Fry, and Claude Calvert Hurd, both of Riverside, Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Apr. 27, 1977, Ser. No. 791,457
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—142.2 **3 Claims**



3. In a ventilator for a patient including means for providing an inhalation phase and an exhalation phase in its operative system having patient connection means and pressure responsive exhalation valve means and including means for determining and providing a positive end expiratory reference pressure in respect to a patient user of said ventilator system with means for distribution of said positive end expiratory reference pressure within the system of the ventilator and first sensing means for sensing a pressure differential between an effort to breathe initiated by said patient user of said ventilator and said reference pressure, and means responsive to said first sensing means within the system of said ventilator for controlling a supply of breatheable gas to be furnished to the patient user of said ventilator and additionally providing second sensing means for sensing a pressure differential between an end expiratory lung pressure remaining in said patient user's lungs at the termination of an expiration and said reference pressure and for varying said patient user's end expiratory lung pressure during any exhalation phase as a function of said positive end expiratory reference pressure, said second sensing and varying means comprising:

a valve housing;

first pressure chamber means in said housing including a first pressure port means communicating with said patient connection means;

second pressure chamber means also defined in said housing including a second pressure port means communicating with said distributing means;

flexible resilient means located in said housing for separating said first pressure chamber means from said second chamber means and resiliently movable therebetween;

an adjustable valve fitting mounted on said valve housing having a third pressure port means communicating with said exhalation valve means;

a valve seat in said adjustable valve fitting communicating with said third pressure port;

ball valve means in said adjustable valve fitting for seating at said valve seat;

shaft means linking said ball valve to said flexible resilient means;

spring means in said second pressure chamber operative to maintain positive bias upon said flexible resilient means so as to maintain said ball valve seated against said valve seat;

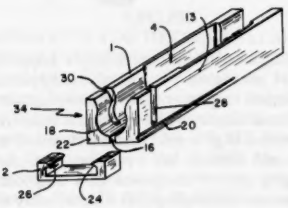
fourth pressure port means in fluid communication with atmospheric pressure and said third pressure port means when said ball valve means is unseated from said valve seat thereby, varying the pressure in said pressure responsive exhalation valve means during any exhalation phase as a function of said positive end expiratory reference pressure.

4,082,094

LOCKING DEVICE FOR INTRAVENOUS INSERT

Calvin L. Dailey, 884 6th St., Petaluma, Calif. 94952

Filed Sep. 13, 1976, Ser. No. 723,047
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R **8 Claims**



1. In a locking device for firmly but releasably holding a tubing connection between a vein insert and supply tubing for intravenous fluid, a body formed of resilient material, said body being provided with a shaped channel extending along its length, said body being compressible transverse to said channel whereby side portions of said body on each side of said channel can be forcibly depressed toward one another, and means for releasably applying compression on said side portions of said body to forcibly depress said side portions toward one another to engage and hold both the vein insert and the supply tubing within said shaped channel of said body.

4,082,095

STOMACH PUMP

Barry Mendelson, Spring Valley, N.Y., and Stephen A. Denman, Dayton, Ohio, assignors to Barry Mendelson, Spring Valley, N.Y.

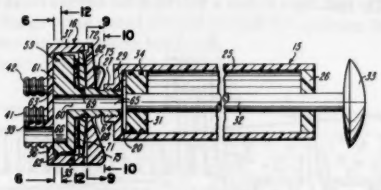
Continuation of Ser. No. 621,061, Oct. 9, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 816,539
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—235 **17 Claims**

1. Intubation apparatus comprising:

a syringe having an end portion including an opening communicating with the interior of said syringe, and

a valve assembly connected to said syringe end portion

including a housing having a plurality of ports, a rotor member, said housing and rotor member being rotatably mounted with respect to each other; first means for automatically setting said housing and rotor member into a selected one of a first portion of a plurality of operating positions relative to each other solely by rotating said housing relative to said rotor member, said plurality of operating positions corresponding to said plurality of ports; means formed by said housing and rotor member for providing a fluid passage between a selected one of said ports and said opening in said syringe end portion



upon setting said housing and rotor member in a corresponding selected operating position; and second means including detent means for setting said housing and rotor member into a selected one of a second remaining portion of said plurality of operating positions by releasing said detent means and rotating said housing relative to said rotor member, whereby the provision of a fluid passage between one of said plurality of ports corresponding to one of the second portion of said plurality of operating positions and said syringe opening solely by rotating said housing relative to said rotor member is normally prevented.

4,082,096

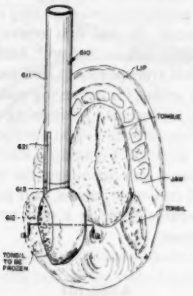
CRYOSURGICAL SYSTEM

Jerrel W. Benson, 2580 Snowberry La., Pepper Pike, Ohio 44124

Division of Ser. No. 423,013, Dec. 10, 1973, Pat. No. 4,022,215. This application Feb. 9, 1977, Ser. No. 767,043

Int. Cl.² A61B *17/36*

U.S. Cl. 128—303.1 **6 Claims**



1. A method of cooling selected surface areas of living tissues comprising the steps of:

(a) covering a resilient mass of porous material with a deformable liquid cryogen impervious membrane capable of confining liquid cryogen within said mass;

(b) conforming the membrane covered mass to a configuration which corresponds to the size and shape of the surface areas to be treated;

(c) pressing the preshaped membrane covered mass into firm engagement with the surface areas to be treated;

(d) introducing a controlled supply of liquid cryogen into said mass whereby the porous mass ducts the liquid cryogen along a densely interconnected array of flowpaths into contact with said membrane and heat is transferred from the surface areas to be treated through said membrane to said liquid cryogen; and,

(e) the step of pressing the membrane covered mass into engagement with the surface areas to be treated being performed with sufficient force to cut off the normal flow of blood through said tissues thereby permitting said tissues to freeze far more rapidly than would be possible if normal blood flow were maintained during the initial stages of freezing.

4,082,097

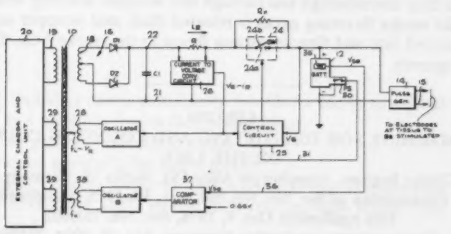
MULTIMODE RECHARGING SYSTEM FOR LIVING TISSUE STIMULATORS

Alfred E. Mann, and Joseph H. Schulman, both of Los Angeles, Calif., assignors to Pacesetter Systems Inc., Sylmar, Calif.

Filed May 20, 1976, Ser. No. 688,411

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 PS **16 Claims**



1. A rechargeable tissue stimulation system adapted to be in part implanted in the body of a patient for applying electrical stimulation pulses to selected body tissue comprising:

implanted pulse circuit means for generating and applying said stimulation pulses;

implanted rechargeable battery means operably connected to supply operating energy to said pulse circuit means;

implanted means including at least first sensing means coupled to said battery means for sensing the state-of-charge of said battery means and for transmitting a first signal when the state-of-charge of said battery means reaches a first level;

external means including an external source for providing recharging energy; and

implanted recharge means responsive to recharging energy provided by said external source for recharging said battery means, means for generating and transmitting a signal indicative of the rate said recharge means recharge said battery means, said external means including receiver means for receiving said first signal and the signal indicative of the rate said battery means is recharged, and external circuit means responsive to the signals received by said receiver means for controlling the energy supplied by said source.

4,082,098

FLAVORED CIGARETTE

William F. Owens, Jr., Pisgah Forest, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

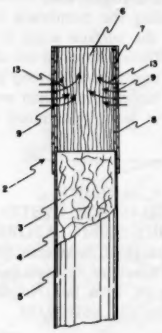
Filed Oct. 28, 1976, Ser. No. 736,421

Int. Cl.² A24D *1/02, 1/04*

U.S. Cl. 131—9 **5 Claims**

1. A flavored ventilated filter tip cigarette comprising a tobacco column and an abutting filter, said filter enclosed by an air permeable wrapper impregnated with a volatile smoke flavoring agent, a tipping envelope enclosing said enclosed filter having a ventilated area in communication with said wrapper, said envelope and wrapper being adhered together

over regions of their contiguous surfaces but not over the ventilated area in said tipping envelope, said ventilated area being adhesive-free and air permeable permitting ambient air



to flow therethrough and through said wrapper whereby volatile smoke flavoring agent is released from said wrapper and carried into said filter imparting flavor to the smoke from the cigarette.

4,082,099

MACHINE FOR IDENTIFYING AND COUNTING COINS OR THE LIKE

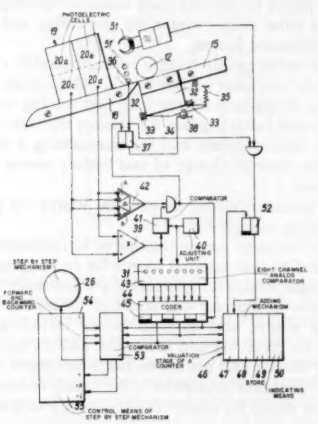
Günter Iwersen, Angerburger Allee 551, Berlin 19, Germany

Continuation of Ser. No. 566,760, Apr. 10, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 731,002

Claims priority, application Germany, Apr. 19, 1974, 2419597

Int. Cl.[2] G07D *3/16*

U.S. Cl. 133—3 R **6 Claims**



1. Apparatus for identifying and counting coins, coin-like tokens or the like comprising an optico-electronical signal transmitter past which the coins are adapted to be guided and which supplies signals corresponding to different sizes of the coins or the like to at least one counter, characterized in that the optico-electronical signal transmitter is formed by an image converter consisting of two identical cells arranged side by side in the moving direction of the coins and abutting each other along an abut joint, which cells gauge the surface of the silhouette of the respective coins and supply signals analogous to that part of the surface measured by each of them to a summation unit and a zero-passage discriminator, which discriminator when equal voltages are reached at the outputs of the cells initiates the summation unit to at least one rating comparator which in its turn feeds the counter with the rating results.

4,082,100

APPARATUS FOR COOLING HOT SLABS

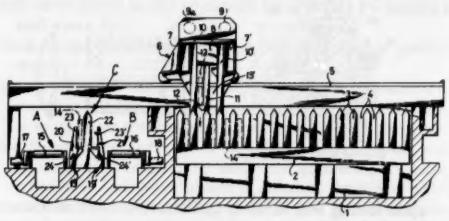
Willi Bruno Manthey, Duisburg, and Horst Deiwick, Krefeld-Gartenstadt, both of Germany, assignors to BWG Bergwerk- und Walzwerk-Maschinenbau GmbH, Duisburg, Germany

Filed Apr. 11, 1977, Ser. No. 786,396

Claims priority, application Germany, Apr. 10, 1976, 2615924

Int. Cl.[2] B08B *3/04*

U.S. Cl. 134—76 **10 Claims**



1. In an apparatus for cooling hot slabs in a soaking pit divided into a plurality of slab-receiving compartments, wherein a railborne transporter includes a traverse spanning said pit, first and second guide means fixedly depending from said traverse at locations separated in the transport direction, vertically movable gripper means on said traverse disposed between said first and second guide means and defining therewith a first and a second carrying cage alignable with a pair of adjoining compartments, hoist means for raising and lowering said gripper means, and retractable slab-supporting means on said gripper means alternately extendable across the bottoms of said cages for depositing a hot slab from said first cage in a selected compartment and then lifting a cooled slab into said second cage from an adjoining compartment,

the combination therewith of:

first and second positioning means disposed in a loading zone between a pickup area and a receiving area adjoining said pit, the path of said transporter extending to a stop above said loading zone;

first conveyor means for delivering hot slabs to said pickup area, said first positioning means being operable to engage a slab lying prone on said first conveyor means and to erect the engaged slab in line with said first cage upon a stationing of said transporter at said stop; and

second conveyor means for removing cooled slabs from said receiving area, said second positioning means being alignable with said second cage upon a stationing of said transporter at said stop for engaging a slab lowered erect by said gripper means and depositing the engaged slab prone on said second conveyor means, said gripper means being thereupon operable to seize a slab erected by said first positioning means.

4,082,101

COOLANT NOZZLE APPARATUS IN TWIN-BELT CONTINUOUS CASTING MACHINES

Robert William Hazelett, Winooski, and John Frederick Barry Wood, Burlington, both of Vt., assignors to Hazelett Strip-Casting Corporation, Winooski, Vt.

Division of Ser. No. 602,579, Aug. 7, 1975, Pat. No. 4,002,197, which is a division of Ser. No. 414,237, Nov. 9, 1973, Pat. No. 3,937,270. This application Jun. 9, 1976, Ser. No. 694,340

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—127 **4 Claims**

1. In twin-belt casting machines wherein the casting region is defined between opposed portions of a pair of revolving endless flexible casting belts and wherein at least one of the belts

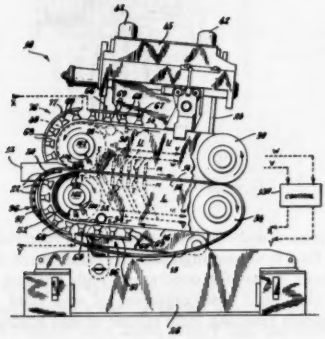
travels partially around a nip roll positioned upstream from the casting region and said nip roll has a plurality of axially spaced narrow circumferential fins with deep circumferential grooves between the respective neighboring fins, coolant apparatus comprising:

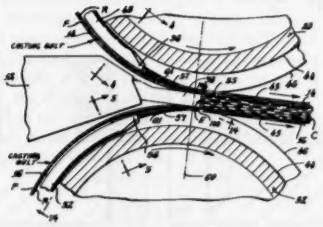
a plurality of curved coolant feed tubes,

said curved coolant feed tubes each being positioned between a pair of said fins and being nested within a respective one of said deep circumferential grooves of the nip roll beneath the casting belt as the belt travels around the nip roll,

each of said curved tubes having a nozzle at its end with its discharge being aimed toward the belt for applying liquid coolant to the casting belt,

a plurality of fingernail-like extenders,





said extenders each being positioned between a pair of said fins and being attached to the end of a respective coolant feed tube,

each extender being positioned between the end of the respective tube to which it is attached and the nearby casting belt,

each extender projecting beyond the nozzle of the respective tube for intercepting and spreading out the liquid coolant being discharged from the nozzle for directing the liquid coolant as a fast moving layer to be applied onto the belt, and each of said fingernail-like extenders having a width just slightly less than the distance between the pair of fins between which it is positioned for shielding the casting belt for preventing the liquid coolant from prematurely engaging the belt.

4,082,102

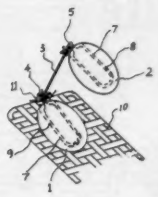
SUNSHADE—FOLDABLE AND HAND-TRANSPORTABLE

Hans Herbert Heuer, 8230 Reche Canyon Rd., Colton, Calif. 92324

Continuation-in-part of Ser. No. 687,539, May 18, 1976, abandoned. This application Apr. 19, 1977, Ser. No. 788,990

Int. Cl.[2] E04F *10/00*

U.S. Cl. 135—5 R **8 Claims**



1. Shielding means particularly suitable for use by an individual as a sunshade for his face, comprising:

first generally flat shield means;

second generally flat shield means;

rigid, elongate means formed into a first loop configuration at one end and a second loop configuration at the other end;

first cylindrical means adapted to fit snugly within said first loop configuration;

second cylindrical means adapted to fit snugly within said second loop configuration;

said first generally flat shield means and said first cylindrical means being adapted for interconnection in use whereby the first cylindrical means seated in said first loop configuration serves as a pivot for fan-like adjustment of the first shield means around said one end of said rigid elongate means;

said second generally flat shield means and said second cylindrical means being adapted for interconnection in use whereby the second cylindrical means seated in said second loop configuration serves as a pivot for fan-like adjustment of the second shield means around said other end of said rigid elongate means;

said rigid, elongate means including manual loop size adjusting means to permit independent adjustment of the loop size at each of its end loop configurations;

each of said shield means being rotatable in use around its pivot through at least 300° of rotation;

the parts of said shielding means cooperating so that when it is in use one of the generally flat shield means can be held flush against a horizontal surface by weight means, said rigid elongate means can extend upwardly therefrom at any of various angular adjustments and the other shield means can be adjusted to a position of outward extension from said rigid elongate means at any of a variety of angular positions with respect to the latter;

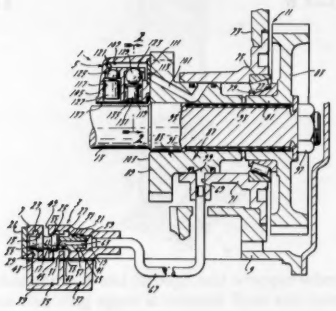
the loop configuration at the pivot of said other shield means being of such character that the weight of that shield means acting through frictional contact of its cooperating cylindrical means with said loop configuration has a tendency to cause tightening of the latter around said cylindrical means which serves to resist downward movement of said other shield means about its pivot under the force of gravity during normal usage of the shielding means by a sunbather.

4,082,103

CENTRIFUGAL FORCE HYDRAULIC GOVERNOR

Uno Kuusik, Royal Oak, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 24, 1976, Ser. No. 722,171
Int. Cl.² G05D *13/36*
U.S. Cl. 137—54 **6 Claims**



1. Governor apparatus comprising a body adapted to be mounted on one side of a rotatable member mounted in a case, said body having a passage therein adapted to be connected to a source of fluid under pressure, first and second cylinders in said body each having a valve opening placing said passage in communication with the cylinder, a vent from each of said cylinders, movable valve means in said cylinders adapted to control the opening and closing of said valve openings, each of said movable valve means including a ball valve member adapted to close said opening and a weight urging said ball toward a closed position in response to rotation of said rotatable members, relay valve means mounted on said case, said relay valve means including a bore, an inlet to and an outlet from said bore, a transfer port, a transfer line means connecting said transfer port to said passage in said body, a vent from said bore, and a valve member movable in said bore to selectively connect said inlet to said outlet and said outlet to said vent, said valve member having a land therein adapted to meter the flow of fluid from said inlet to said outlet, the valve member having a passage therein placing said inlet in communication with said transfer port, and a restriction in said passage.

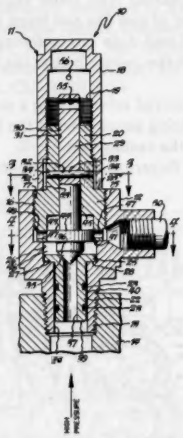
4,082,104

PRESSURE RELIEF VALVE

Joseph G. Keeney, Town of Tonawanda, N.Y., assignor to C. H. Heist Corporation, Clearwater, Fla.

Filed Jun. 21, 1976, Ser. No. 698,087
Int. Cl.² F16K *17/14*
U.S. Cl. 137—71 **23 Claims**

1. A pressure relief valve for a high pressure fluid source comprising a housing, first bore means in said housing, first plunger means having first surface means in effective sliding engagement with said first bore means, second bore means in said first plunger means, third bore means in said housing in alignment with said first bore means, second plunger means having second surface means in effective sliding engagement with said third bore means, third surface means on said second plunger means, fourth surface means on said first plunger means for selective engagement in sealing relationship with said third surface means, fifth surface means on said second plunger means adjacent said third surface means for blocking continuous flow of high pressure fluid through said second bore means and beyond said fifth surface means when said third and fourth surface means are in said sealing relationship, releasable holding means effectively coupled between said second plunger means and said housing to retain said third and fourth surface means in engagement against the force exerted by high pressure fluid against said first plunger means and said fifth surface of said second plunger means, said holding means being responsive to a predetermined pressure valve of said high pressure source to release said second plunger means, means in said housing for permitting said third and fourth surface means to disengage when there is a release of said



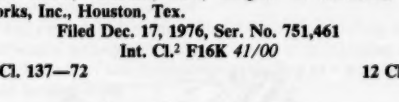
holding means, and conducting means for receiving said high pressure fluid from said high pressure fluid source through said second bore means for conducting high pressure fluid from said housing upon disengagement of said third and fourth surface means resulting from release of said holding means.

4,082,105

VALVE STEM PACKING ASSEMBLY WITH TEMPERATURE RESPONSIVE SEAL

Herbert Allen, Houston, Tex., assignor to Carmeron Iron Works, Inc., Houston, Tex.

Filed Dec. 17, 1976, Ser. No. 751,461
Int. Cl.² F16K *41/00*
U.S. Cl. 137—72 **12 Claims**



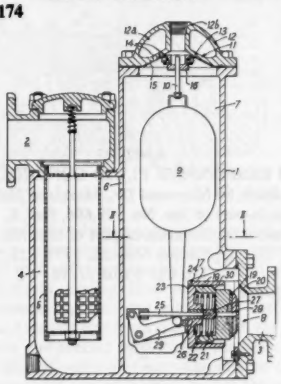
1. A valve, comprising a valve body having a passageway therethrough and an opening therein connecting the passageway with the exterior of the body, a closure member mounted within the body for opening and closing the passageway, a stem extending through the opening and connecting with the closure member for moving it between opened and closed positions, said stem being spaced from the opening to define an annular space therebetween, a packing of resilient material disposed within the space for sealing between the stem and the opening, at least one relatively rigid, spring-like annular element disposed within said space, and means holding each said element in a distorted shape in which its outside diameter is closely received within the opening and its inside diameter is greater than and substantially concentric with the outside diameter of the stem, said holding means being fusible at a desired temperature to permit each said annular element to return toward an undistorted shape in which its inside diameter

is forced against the outside diameter of the stem and its outside diameter is forced against the opening, whereby the space may be closed despite destruction of the packing by heat.

4,082,106
AIR ELIMINATOR VALVE

Alan George Butcher, Bracknall, England, assignor to Dresser Europe S. A., Brussels, Belgium

Continuation of Ser. No. 510,867, Sep. 30, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,531
Int. Cl.² F16K *31/18*
U.S. Cl. 137—174 **6 Claims**



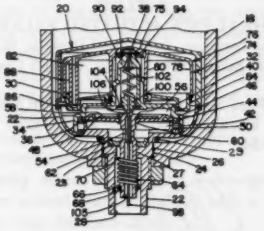
1. An air eliminator valve comprising a housing, a chamber defined by said housing and having an inlet and an outlet for coupling the chamber to a liquid supply line, the valve being disposed in use so that air collects in the upper part of the chamber, a float in the chamber movable along the axis of the chamber which extends through the top of the chamber, an air release valve at the top of the chamber, the air release valve comprising a valve seat having a seating surface generated by a generatrix rotated 360° around said axis and intersecting said axis and extending outwardly therefrom with the portion of the generatrix intersecting said axis being at an angle to said axis, said valve seat surface having thruflow apertures therein, a flexible diaphragm of generally annular configuration for superposed placement against the seating surface of the valve seat to seal the vent apertures, means securing one end of said diaphragm while leaving the other end free and a coupling connecting the free end of the diaphragm with the float, whereby when the float falls it peels the diaphragm away from its placement position against the seat surface to uncover the vent apertures and allow venting of the air.

4,082,107
AUTOMATIC DRAIN VALVE FOR A COMPRESSED AIR SYSTEM

Robert K. Hoffman, Plainwell, and David C. Franson, Kalamazoo, both of Mich., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 637,134, Dec. 3, 1975, abandoned. This application May 4, 1977, Ser. No. 793,691
Int. Cl.² F16T *1/20*
U.S. Cl. 137—195 **7 Claims**

1. A valve for automatically draining liquid from a pressurized air system comprising a container having an inlet and an outlet for connection to the system and having a space at its lower end for collecting liquid separated from said air and a space at its upper end for receiving air under pressure from the system, an insert mounted in an opening at the lower end of the container and having a passage therethrough, an inverted cup-shaped member secured to said insert and having screen means in its side wall, a body attached to the insert in radially spaced relation within said member to form a housing with a chamber therein, a diaphragm separating the chamber into upper and lower chambers, a valve element sealingly engaging the diaphragm and extending into the insert passage to close the insert passage and form a differential area across the valve element, resilient means biasing the valve element to a position opening the passage, the housing having a first passage communicating said lower space with the lower chamber through said screen means and having a second passage communicating said upper space with the upper chamber also through said

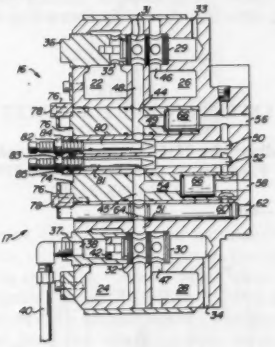


screen means, a float within said member normally closing said second passage, said float being movable by liquid in said lower space toward the upper wall of said member when the liquid reaches a predetermined level to open said second passage so that the air pressure in the upper chamber and the liquid pressure in the lower chamber offset each other whereby said resilient means and the pressure acting against the differential area move the diaphragm and the valve element to an open position and liquid in the lower chamber flows through the insert passage to drain the container.

4,082,108
VALVE BLOCK

Thomas Dininio, Milville, N.J., assignor to Maul Technology Corporation, Indianapolis, Ind.

Filed Jul. 19, 1976, Ser. No. 706,647
Int. Cl.² F16K *11/10*
U.S. Cl. 137—269.5 **18 Claims**



1. A valve block assembly for use in glassware forming machines comprising:

a valve block having at least two rows of valve stations arranged parallel to one another;

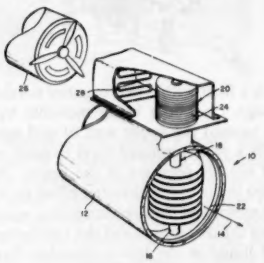
a separate air supply manifold communicating with each of said rows of valve stations for supplying pressurized air to said valve stations;

a separate air exhaust manifold communicating with each of said rows of valve stations for exhausting air from said valve stations;

a cartridge valve disposed at each of said valve stations for controlling the flow of air through a respective valve station;

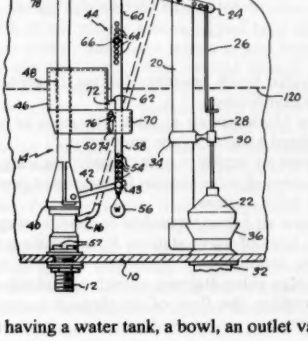
an outlet conduit forming a flow path away from each of said cartridge valves;
a flow control valve disposed within said outlet conduits;
a check valve disposed within at least one of said outlet conduits, all said flow control and check valves being between elevations of said manifolds; and means for retaining each said check valves within its respective outlet conduit, said retaining means being removable from a front face of said valve block.

4,082,109
HEAT PIPE ACTUATED VALVE
Tsu-Hung Sun, Torrance, and Algerd Basiulis, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Sep. 3, 1976, Ser. No. 720,339
Int. Cl.[2] G05D *7/03;* F16K *13/00*
U.S. Cl. 137—340 **10 Claims**



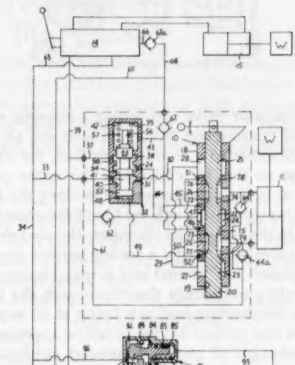
1. A heat pipe actuated valve comprising:
means for defining a flow path for matter which is capable of changing its viscosity; and
at least one bidirectional heat pipe thermally coupled to said matter for transferring heat from and to said matter and thereby for changing the viscosity of said matter and its rate of flow through said flow path means and for causing said matter itself to check, permit and regulate its own flow by means of its changed viscosity respectively by shutting, opening and partially obstructing said flow path means.

4,082,110
WATER LEVEL CONTROL FOR TOILET HAVING VERTICAL FLOAT
John L. Woodbury, Jr., 7515 Cornith Dr., Alexandria, Va. 22306
Filed Oct. 6, 1976, Ser. No. 730,079
Int. Cl.[2] F16K *31/18*
U.S. Cl. 137—426 **16 Claims**



1. In a toilet having a water tank, a bowl, an outlet valve for releasing the water in said tank to flush wastes from said bowl, an inlet valve for supplying water to said tank, said inlet valve being controlled by a float mounted for vertical movement on a vertically oriented guide, the improvement which comprises adjustment means selectively coupling said float to said inlet valve for adjusting the water level within said tank at which said inlet valve is turned off, and means mounted externally of said tank for actuating said adjustment means, said adjustment means comprising catch means disposed on said float and lever means coupled to said inlet valve and having notch means selectively engageable by said catch means.

4,082,111
LOAD RESPONSIVE FLUID CONTROL VALVE
Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022
Continuation-in-part of Ser. No. 729,696, Oct. 5, 1976, Pat. No. 4,028,889, and a continuation-in-part of Ser. No. 773,421, Feb. 28, 1977. This application May 26, 1977, Ser. No. 800,934
Int. Cl.[2] F15B *11/16*
U.S. Cl. 137—596 **11 Claims**

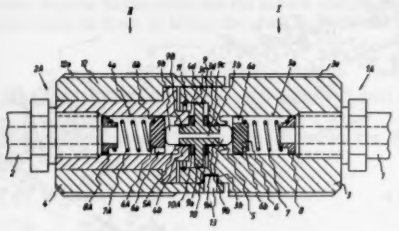


1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber and said fluid exhaust means, first variable metering orifice means responsive to movement of said first valve means and operable to throttle fluid flow between said fluid supply chamber and said load chambers, second variable metering orifice means responsive to movement of said first valve means and operable to throttle fluid flow between said load chambers and said fluid exhaust means, second valve means having inlet fluid isolating means between said fluid inlet chamber and said fluid supply chamber, actuating means in said fluid isolating means operable to isolate by said fluid isolating means said fluid inlet chamber from said load chambers when one of said load chambers is interconnected to said fluid exhaust means by said first valve means and said load chamber is pressurized, and fluid replenishing means operable to supply fluid flow from said fluid exhaust means to one of said load load chambers which is not pressurized when said fluid isolating means isolate said fluid inlet chamber from said fluid load chambers.

4,082,112
HOSE COUPLING

Manfred Schmidt, Munich, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Aug. 11, 1976, Ser. No. 713,450
Claims priority, application Germany, Aug. 22, 1975, 2537407
Int. Cl.[2] F16K *37/28*
U.S. Cl. 137—614.03 12 Claims



1. A connector for conduits, particularly a quick-disconnect coupling for hoses, comprising first and second valve housings each connected to a different conduit, said first and second housings respectively having first and second open-ended passages communicating with the interior of the respective conduits, first and second end faces remote from the respective conduits and first and second seats facing the respective conduits; first and second valve elements provided in the respective housings; first and second biasing means for urging said first and second valve elements against the respective seats; a tubular member installed in said first housing at the open end of said first passage and having first and second actuating portions and a third portion disposed between and extending radially beyond said actuating portions, said third portion being located intermediate said end faces when said housings are attached to each other and said tubular member being movable in said first housing between a first position in which said first actuating portion disengages said first valve element from the respective seat and a second position in which said first biasing means maintains said first valve element in sealing engagement with the respective seat; means for separably attaching said housings to each other in such positions that said second actuating portion extends through the open end of and into said second passage and disengages said second valve element from the respective seat whereby said second biasing means maintains said tubular member in said first position through the medium of said second valve element; a first elastic sealing ring surrounding said first actuating portion between said third portion and said first end face; and a second elastic sealing ring surrounding said second actuating portion between said third portion and said second end face, said sealing rings being compressible to an extent which at least equals the extent of movement of said tubular member between said first and second positions.

4,082,113
TIMING DEVICE WITH TRIPPING MECHANISM FOR FLUID VALVE

Charles P. O'Neil, Milwaukee, Wis., assignor to Amerace Corporation, New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,453
Int. Cl.[2] F15B *21/10*
U.S. Cl. 137—624.11 28 Claims

1. In a timing device for actuating a fluid valve upon expiration of a prescribed timed interval following a given event, the timing device including

a frame;

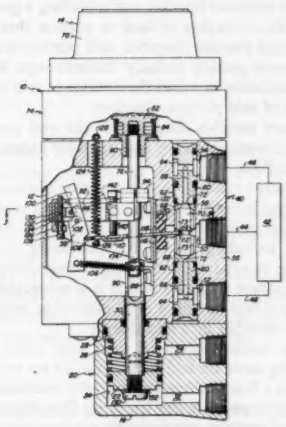
a motion transmitting member mounted in the frame for movement along a prescribed path of travel in either one of two directions between a first location and a second location;

timing means on the frame coupled with the motion transmitting member for effecting movement of the motion transmitting member at a predetermined rate in one only of said two directions to establish said timed interval between the departure of said motion transmitting member from the first location thereof and the arrival of the motion transmitting member at the second location, and permitting return movement of the motion transmitting member from the second location to the first location at an unrestricted rate;

a fluid valve having a valve seat, a valve element movable into and out of engagement with the valve seat so as respectively to close and open the fluid valve, and a valve-operating lever movable between a first position and a second position, the valve-operating lever being coupled with the valve element such that the fluid valve is open in the first position of the valve-operating lever and is closed in the second position of the valve-operating lever;

the improvement comprising:

resilient biasing means biasing the valve-operating lever toward the second position thereof with a biasing force tending to close the fluid valve;



a latch mounted upon the frame for movement between a first position, wherein the latch engages the valve-operating lever to retain the valve-operating lever in the first position thereof against the biasing force of the resilient biasing means, and a second position, wherein the latch is disengaged from the valve-operating lever to permit movement of the valve-operating lever to the second position thereof in response to the biasing force of the resilient biasing means;

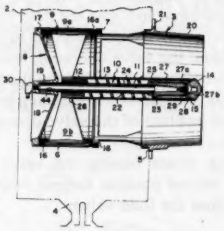
a trip arm carried by the motion transmitting member for movement therewith; and

means coupling the trip arm with the latch for movement of the latch from the first position thereof toward the second position thereof in response to movement of the motion transmitting member from the first location toward the second location to place the latch at the second position thereof upon the arrival of the motion transmitting member at the second location, whereby the valve element will be biased against the valve seat by the biasing force of the resilient biasing means.

4,082,114
VALVE ASSEMBLY FOR USE IN AN AIR DISTRIBUTION SYSTEM

Gerhard John Hantke, La Crosse, Wis., and Harry Kenneth Ring, Jr., Houston, Minn., assignors to The Trane Company, La Crosse, Wis.

Filed Jan. 28, 1977, Ser. No. 763,735
Int. Cl.[2] F16K *31/12, 31/04;* F24F *7/00*
U.S. Cl. 137—625.37 **30 Claims**



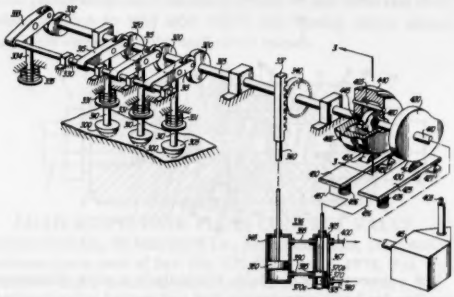
1. A valve assembly for use in an air distribution system comprising:
   a. a plenum chamber having an inlet opening and an outlet;
   b. conduit means for admitting air to said plenum chamber through said inlet opening and including a generally cylindrical sleeve having at least a portion thereof disposed within said plenum chamber, said portion including aperture means passing radially therethrough for providing communication between the interior of said sleeve and the interior of said plenum chamber;
   c. a closure member disposed at the end portion of said sleeve downstream from said aperture means for blocking axial air flow;
   d. a generally cylindrical valve member disposed within said sleeve and including an axially extending portion adjacent the inner periphery of said sleeve, said valve member further including means for providing communication between its axial ends to thereby substantially balance the axial pressure forces to which it is subjected;
   e. tubular means having a bore extending axially from said closure member into said sleeve;
   f. bearing means associated with said valve member for mounting same on said tubular means for axial movement between a first position substantially coextensive with said aperture means, thereby blocking flow therethrough, and a second position substantially non-coextensive with said aperture means for permitting flow therethrough;
   g. actuator means drivingly connected to said valve member for selectively positioning same between said first and second positions, said actuator means comprising
      i. connecting means fastened to said valve member and extending axially therefrom to a position upstream from the end of said tubular means, terminating in a portion adapted to receive an axial force; and
      ii. means for applying an axial force to said force receiving portion by way of the bore in said tubular means.

4,082,115
VALVE OPERATOR

George H. Gibb, Swampscott, and Henry A. Rabeau, Haverhill, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,351
Int. Cl.[2] F15B *13/10;* F16K *11/14, 31/163*
U.S. Cl. 137—630.2 **13 Claims**

1. An operator for steam turbine inlet control valves, said operator comprising:
   (a) a cam shaft having disposed thereon in axially spaced relationship a plurality of valve cams, each arranged to effect movement of one of said valves;
   (b) hydraulic means for positioning said valve cams to effect opening and closing of the valves;
   (c) mechanical means for positioning said valve cams to effect opening and closing of the valves;
   (d) manual actuation means for actuating said hydraulic means to move said valve cams in a normal mode of operation, said manual actuation means normally being ineffective for actuating said mechanical means but automatically

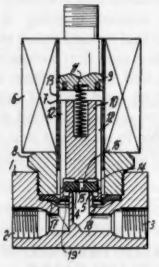


becoming effective to actuate said mechanical means in a back-up mode of operation in the event of failure of said hydraulic means; and
   (e) each of said cams being shaped to cause a relatively slower movement of the corresponding valve during the time of initial valve opening movement than during the remainder of the valve opening movement, thereby limiting the force required to be applied to said manual actuation means in the back-up mode of operation.

4,082,116
ELECTROMAGNETIC TWO-WAY VALVE

Harald Stampfli, Petit-Saconnex, Switzerland, assignor to Lucifer S.A., Carouge, Switzerland

Filed Jun. 16, 1976, Ser. No. 696,863
Claims priority, application Switzerland, Jun. 27, 1975, 8354/75
Int. Cl. F16k *31/06*
U.S. Cl. 137—630.14 **7 Claims**



1. An electromagnetic two-way valve comprising a body, a magnetic core movable under the effect of a magnetic field produced by an electrical winding, a mobile portion movable with said core, a generally disc shaped clack carried by said mobile portion and movable axially with respect thereto, an axially extending valve seat portion provided with a valve seat defining an outlet passage formed in said body in a position to be engaged by said clack, a bleeder hole centrally disposed in said clack, said mobile portion having a flange portion extending closely adjacent said seat portion to form a restricted inlet passageway from a main inlet to a lower face of the clock, said clack having an outer circumference substantially greater than that of the seat and disposed in a position to engage said flange

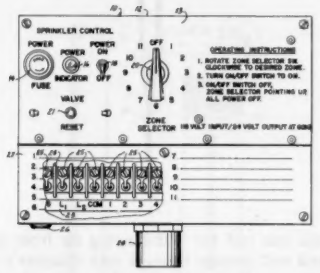
portion upon upward movement thereof, said mobile portion having an annular rib seat portion engageable with said opposite face of the clack in a position to close the bleeder hole, whereby upon initial upward movement of said core and mobile portion, the bleeder hole in the clack is first uncovered permitting a reduction of pressure in the space thereabove, and upon further upward movement, the clack is engaged by the flange portion to close said restricted passageway, at which point the inlet pressure of the incoming fluid will give an upward impulse to the clack and the mobile portion to aid the electromagnetic force in lifting the clack from its seat.

4,082,117

MANUALLY OPERATED LAWN SPRINKLING OR IRRIGATING SYSTEM

Augustus W. Peckham, 12960 Sophia Cir., Largo, Fla. 33540

Filed Jun. 18, 1976, Ser. No. 697,331
Int. Cl.[2] E03B *1/00*
U.S. Cl. 137—870 **4 Claims**



1. In combination with a system for selectively irrigating remote zones each having electromagnetically operated valves for controlling the irrigation, a control box having mounted thereon a rotary zone selector switch having a center terminal and a series of spaced terminals, and a double pole single throw switch, said control box having mounted thereon a transformer having primary and secondary windings, and terminal connection means having first and second power input terminals, a common terminal, a series of terminals for connection to said electromagnetically operated valves, and an accessory terminal, an electrical connection from said first input terminal to said primary transformer winding, an electrical connection from said second input terminal through said double pole single throw switch to said transformer primary winding, an electrical connection from said transformer secondary winding to the center terminal of said zone selector switch, an electrical connection from said transformer secondary winding to the common terminal of the terminal connection means, electrical connections from each of said series of said spaced zone selector switch terminals to said series of terminals for said valves, respectively, and an electrical connection from one said secondary transformer connection through said double pole single throw switch to said accessory terminal.

4,082,118

PNEUMATIC PICKING MECHANISM FOR LOOMS

Philip A. Nims, Auburn, Mass., assignor to Crompton & Knowles Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 734,144, Oct. 20, 1976, abandoned. This application May 25, 1977, Ser. No. 800,488
Int. Cl.[2] D03D *49/26*
U.S. Cl. 139—144 **4 Claims**

1. A pneumatic shuttle picking mechanism for looms comprising:

(a) a picking cylinder having an inlet end and an outlet end;

(b) a piston slidable within said picking cylinder between said inlet and outlet ends;

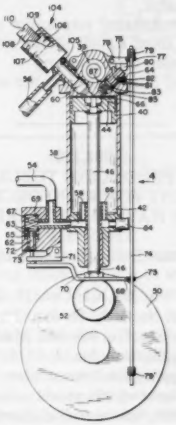
(c) a piston rod attached to said piston and which extends through said outlet end for picking engagement with a shuttle;

(d) a pump cylinder having an inlet end and an outlet end;

(e) a pump piston slidable within said pump cylinder between the inlet and outlet ends of said pump cylinder;

(f) a pump piston rod attached to said pump piston and which extends through the inlet end of said pump cylinder;

(g) drive means connected to the extending portion of said pump piston rod for reciprocating said pump piston rod and said pump piston;



(h) a first conduit for pneumatically connecting the inlet end of said picking cylinder to the outlet end of said pump cylinder;

(i) a second conduit for pneumatically connecting the outlet end of said picking cylinder to the inlet end of said pump cylinder; and

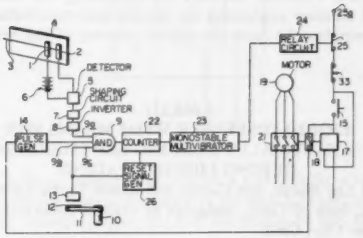
(j) a one-way valve located at one end of said pump cylinder which allows air to enter said pump cylinder from the atmosphere when the pressure within the cylinder at said one end falls below atmospheric pressure.

4,082,119

METHOD OF AND DEVICE FOR CONTROLLING A WEAVING LOOM

Kozo Washino, Hachioji, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 22, 1976, Ser. No. 743,954
Claims priority, application Japan, Nov. 25, 1975, 50-140266
Int. Cl.[2] D03D *51/34*
U.S. Cl. 139—370.2 **13 Claims**



1. A method of controlling a weft inserting motion of a weaving loom for stopping the loom in response to failure in the weft inserting motion, which loom is equipped with detecting means provided at the opposite side with respect to a weft

yarn shooting means, and which method comprises the steps of:

monitoring the operation of the loom and producing a train of first signals at time intervals in synchronism with the motion of the loom, each of the first signals representing a detecting time period for controlling the weft inserting motion;

monitoring picks of a weft shot into a shed of warp yarns and producing a second signal representing whether the weft yarn is detected by the detecting means;

producing a train of third signals at a predetermined time intervals;

storing the third signals only if the first signal coincides with the second signal;

producing a control signal responsive to a predetermined number of the third signals stored within the detecting time period to stop the loom; and

clearing the stored third signals at the end of the detecting time period.

4,082,120

METHOD OF PRODUCING TUBULAR LATTICE REINFORCEMENT FOR REINFORCED CONCRETE TUBULAR PIPE HAVING A SOCKET AT ONE END THEREOF

Maurice Francois, Saint Dizier, France, assignor to Trefilunion, Paris, France

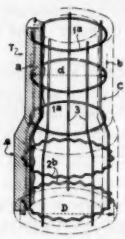
Division of Ser. No. 298,321, Oct. 17, 1972, which is a continuation of Ser. No. 109,244, Jan. 25, 1971, abandoned, which is a division of Ser. No. 808,252, Mar. 18, 1969, Pat. No. 3,578,036. This application Jan. 3, 1975, Ser. No. 538,479

Claims priority, application France, Mar. 22, 1968, 68.144908

The portion of the term of this patent subsequent to May 11, 1998, has been disclaimed.

Int. Cl.[2] B21F *27/22*

U.S. Cl. 140—107 **1 Claim**



1. A method of producing a tubular lattice reinforcement for reinforced concrete tubular pipe having a socket at one end thereof, the method comprising: providing a flat lattice of longitudinal and transverse members connected together at their crossing points, the transverse members adjacent one end of the lattice being highly ductile and stretchable, forming said lattice into a tubular member, and expanding one end of the tubular member containing the ductile and stretchable transverse members to form the socket portion of the reinforcement.

4,082,121

LIQUID DISPENSER WITH MEANS FOR AUTOMATICALLY PURGING AIR THEREFROM DURING LIQUID LOADING

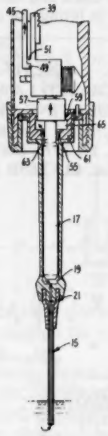
Ronald Leo Sturm, San Carlos, and James Curtis Smith, Hayward, both of Calif., assignors to Oxford Laboratories Inc., Foster City, Calif.

Filed Aug. 25, 1976, Ser. No. 717,745

Int. Cl.[2] B65B *3/12*

U.S. Cl. 141—27 **13 Claims**

1. In a liquid dispensing device that includes a piston chamber having a passage at one end for fluid flow therethrough into and out of said chamber, and a piston entering the chamber from its other end but not capable of entering said passage, means providing a fluid tight seal between said chamber and said piston, whereby movement of the piston within the piston chamber moved fluid through its said passage, an improvement for purging air from the piston chamber while it is being filled with liquid, comprising means automatically operable when the piston is moved in said piston chamber in a direction away



from its said one end for withdrawing air from said piston chamber and said passage through said chamber's other end while simultaneously drawing liquid into the chamber at its said one end from a liquid source in response to fluid displacement within the chamber of the withdrawing piston, whereby a volume of air interface between said piston and said liquid source is eliminated during the same piston stroke that draws liquid into the piston chamber and passage.

4,082,122

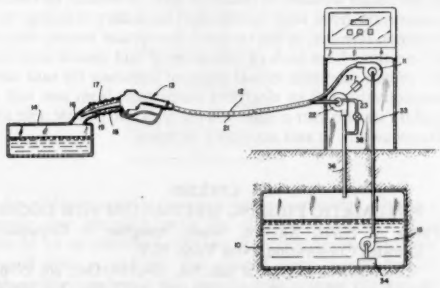
CLOSED FUEL SYSTEM WITH VACUUM ASSIST

Dean C. McGahey, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 19, 1976, Ser. No. 733,819

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—5 **9 Claims**



1. In a closed fuel system for conducting vaporizable liquid fuel from a source thereof including a storage tank, into a receiving fuel tank having a filler pipe, and for concurrently conducting a stream of vapor from said receiving tank to said storage tank during a fuel transfer operation, whereby to stabilize the closed system,

a fuel dispensing nozzle removably connected with said tank filler pipe,

a hydraulic motor having an inlet communicated with said fuel storage tank to receive a stream of liquid fuel therefrom, and having a discharge port communicated with said dispensing nozzle,

a vapor pump having an inlet port communicated with said fuel receiving tank to receive vapors displaced therefrom as liquid fuel enters said receiving tank, and having a discharge port communicated with said storage tank,

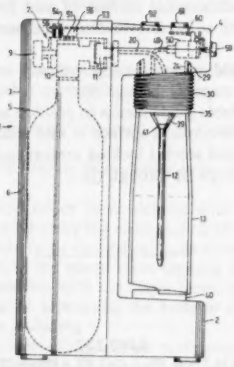
and a valved passage means communicated with said pump inlet and discharge ports respectively to permit a controlled vaporous flow through said passage means.

4,082,123

CARBONATING APPARATUS

Peter F. Haythornthwaite, and Victor K. Relf, both of Auckland, New Zealand, assignors to Sodaflo Drinks Limited, Wellington, New Zealand

Filed Oct. 26, 1976, Ser. No. 735,338
Int. Cl.[2] B65B *31/06*
U.S. Cl. 141—64 **21 Claims**



1. A carbonating apparatus comprising a stand holding a gas supply means, an injecting nozzle pivotally mounted to the stand for movement about a substantially horizontal axis, said nozzle being adapted to pass through an opening of a bottle or other container and into a liquid contained therein, said nozzle being pivotal between a first inclined position allowing the bottle or other container holding the liquid to be carbonated to be introduced into the apparatus and to be penetrated by said nozzle and a second substantially upright position, supporting means to support the bottle at said second position so that said liquid may be carbonated by gas introduced through said nozzle from said gas supply means via a gas supply system means to seal the opening of the bottle or other container while being carbonated, said means comprising a stopper on said ejecting nozzle, said stopper being slideable along the nozzle to press against the opening of the bottle or other container under the influence of biasing means.

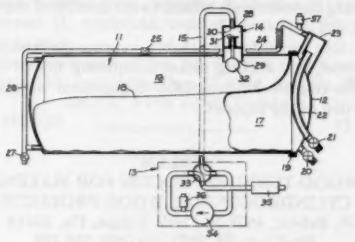
4,082,124

HANDLING FLUENT MEDIA

David Henry Jenkins, Leamington Spa, England, assignor to The Eagle Engineering Company Limited, Warwick, England

Filed Apr. 29, 1976, Ser. No. 681,558
Claims priority, application United Kingdom, May 2, 1975, 18389/75
Int. Cl.[2] B65B *31/04*
U.S. Cl. 141—65 **3 Claims**

1. A tanker vehicle for collection, transport and disposal of fluent media comprising a rigid vessel mounted on a vehicle chassis, one end wall of said vessel being formed as an openable door; a bag-shaped impervious flexiable diaphragm mounted within the vessel to divide it into respective enclosed variable volume propulsion and holding chambers, the holding chamber being bounded in part by said door, the maximum volume of either chamber being substantially the total volume of the vessel, and the two chambers changing in volume during operation in inverse relationship; an inlet duct and a discharge duct for fluent media mounted on said vessel and opening respectively into upper and lower regions of the holding chamber; an exhauster pump mounted on the vehicle and connected to be driven from a power source of the vehicle, means whereby said pump is selectively operable through a flow-reversing changeover valve connected to the propulsion chamber on the one hand to draw air from said propulsion chamber so as to



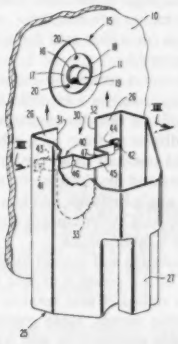
diminish its volume and lower the pressure in the holding chamber for drawing fluent media into said holding chamber through the inlet duct, and to on the other hand pressurize the propulsion chamber so as to increase its volume and expel contents of the holding chambers through said discharge duct; a purging duct linking said upper region and the propulsion chamber through an interconnecting valve permitting selective transfer of air from the holding chamber as fluent media is being drawn into said holding chamber; and cut-off valve operating automatically to isolate said exhauster pump from the propulsion chamber when the volume of the holding chamber reaches a predetermined maximum.

4,082,125

SPILLAGE COLLECTION DEVICE FOR FUEL TANKS FOR BOATS

Layton G. Wilson, 226 Yarmouth La., Media, Pa. 19063, and William Ward, IV, 8 Kershaw Rd., Wallingford, Pa. 19086

Filed Aug. 19, 1976, Ser. No. 715,929
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—86 **9 Claims**



4. A spillage collection device for a fuel tank for a boat, said fuel tank being disposed inboard of the boat hull and having an air vent extending through and externally of the hull, said device comprising:

(a) a hollow receptacle for collecting spilled fuel, said receptacle having a slot defined by opposing interior edges,

(b) a support for the receptacle, said support having an opening for engaging telescopically the externally extend-

ing portion of the air vent, said support having an inner portion disposed contiguous with the exterior surface of the hull and an outer portion spaced from the exterior surface of the hull,

(c) a space between the exterior surface of the hull and the outer portion of the support, said space providing clearance for slidably engaging the receptacle slot with the support,

(d) a retainer for mounting the receptacle on the support to position the receptacle to collect fuel spilled from the air vent, said retainer comprising an elongated flexible strap extending across the slot formed in the receptacle, and having opposite ends affixed to the interior of the receptacle, and

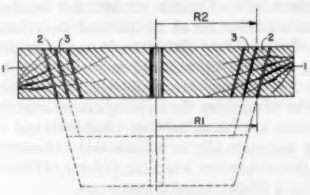
(e) locking means for detachably securing the retainer to the support, said locking means comprising spaced openings in the retainer for detachable engagement with the outer portion of the support.

4,082,126

WOOD-TURNING PROCESS FOR MAKING CYLINDROCONICAL WOOD PRODUCTS

Robert W. Bebout, 4603 N. Clark, Tampa, Fla. 33614

Filed Apr. 18, 1977, Ser. No. 788,270
Int. Cl.[2] B23B *1/00, 5/26*
U.S. Cl. 142—1 **6 Claims**



1. A wood-turning process for manufacturing cylindroconical rings for use as components of cylindroconical wood products comprising:

a. Starting with

i. a gnerally circular disc of wood material axially affixed to an end of a rotatable shaft defining a shaft side of said disc and a nonshaft side;

ii. drive means causing said shaft to rotate at a speed such that the outer edge of said disc travels at a speed of less than 26,000 inches per minute;

iii. frame means on which said drive means and rotatable shaft are mounted;

iv. a shaft-side wood-cutting bit and a nonshaft-side wood-cutting bit mounted in a bit-holding guide means with tooth ends of said bits directed toward each other, said ends being displaced from each other a distance greater than one and one-half times the thickness of said discs;

v. swivel means and first locking means for fixable adjustment of the angle between said bits and the plane of said rotating disc, said swivel means and first locking means mounted on a table means;

vi. table guide means and second locking means for fixable adjustment of the position of said table means and said bits along a radius of said rotating disc of wood material, said table means, table guide means and second locking means mounted on said frame means;

vii. bit-moving means attached to said bit-holding-guide means and said swivel means for the purpose of directing cutting movement of each of said bits through substantially one-half of the thickness of said rotatng disc; and

viii. release means for removing said bit-moving means from attachment to said bit-holding-guide means;

b. using said swivel means to set a desired cylindroconical angle between said bits and said rotating disc plane;

c. actuating said first locking means;

d. using said table guide means to position said bits to cut an outer cylindroconical surface of a first ring;

e. actuating said second locking means;

f. actuating said bit-moving means to cause bit-holding-guide means to direct said non-shaft-side bit to cut, on the non-shaft-side of said disc, a cylindroconical channel of depth approximately equal to one half of the thickness of said disc;

g. actuating said release means and causing said non-shaft-side bit to return to a position of no-contact with said disc;

h. de-actuating said release means and actuating said bit-moving means to cause said shaft-side bit to cut, on the shaft-side of said disc, a cylindroconical channel of depth sufficient to connect with previously cut cylindroconical channel;

i. actuating said release means and causing said shaft-side bit to return to a position of no-contact with said disc;

j. releasing said second locking means;

k. using said table guide means to position said bits to cut an inner cylindroconical surface of said first ring simultaneously with an outer cylindroconical surface of a second ring;

l. actuating said second locking means;

m. repeating steps (f) through (j);

n. using said table guide means to position said bits to cut an inner cylindroconical surface of said second ring;

o. actuating said second locking means; and

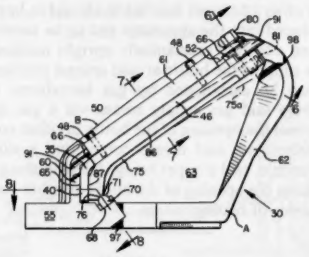
p. repeating steps (f) through (j).

4,082,127

KNIFE HOLDER IN LOG SLABBING CHIPPER

Frederick L. B. Miller, 17353 SW. Canal Cir., Lake Oswego, Oreg. 97034

Filed Apr. 22, 1977, Ser. No. 790,008
Int. Cl.[2] B27G *13/04*
U.S. Cl. 144—220 **9 Claims**

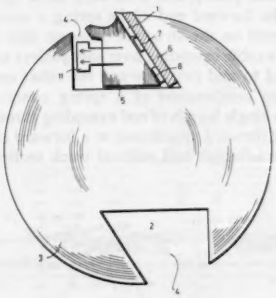


1. A holding means for a woodworking knife comprising a support member having a surface arranged to support one face of the knife, a resilient cambered clamp plate having a convex face confronting the opposite face of said knife, a wedge in said support member confronting the opposite face of said clamp plate along one side of the clamp plate, said opposite face of the clamp plate having a partial cylindrical bearing surface pivoting on a mating partial cylindrical bearing surface on said wedge, screw means in said support member at the opposite side of the clamp plate arranged to pivot the clamp plate on said wedge and flatten the clamp plate against said knife to clamp the knife against said supporting surface, and means to hold the knife in adjusted position on said supporting surface.

4,082,128
PLANING AND DISINTEGRATING APPARATUS

Heinrich Barke, and Gisela Barke, both of Felsenbachstr. 20, Siegen-32-Niederschelden, Germany (5900)

Filed Mar. 30, 1977, Ser. No. 782,758
Int. Cl.[2] B27G *13/04;* B23C *5/20*
U.S. Cl. 144—230 6 Claims

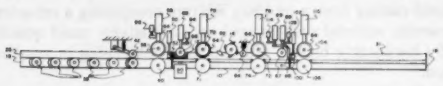


1. An apparatus for planing and disintegrating wood, synthetic resin and other materials, comprising
(a) a carrier,
(b) a knife replaceably mounted in the carrier, the knife having
(1) two parallel major faces defining the thickness of the knife and
(2) two parallel minor faces inclined with respect to the major faces whereby the cross section of the knife taken perpendicularly to the major faces forms a parallelogram, each of the minor faces forming a knife edge at their intersection with the major faces, and
(c) a knife support supporting the knife in the carrier, the knife support including
(1) a first transverse ledge affixed to the support and holding the knife in place with respect to the support, and
(2) a second transverse ledge affixed to the support and spaced from the knife, the second ledge having a thickness in slight excess of the thickness of the knife.

4,082,129
METHOD AND APPARATUS FOR SHAPING AND PLANING BOARDS

Donald L. Morelock, Rte. 1, Box 468, West Linn, Oreg. 97068

Filed Oct. 20, 1976, Ser. No. 734,000
Int. Cl.[2] B27C *9/04, 5/06*
U.S. Cl. 144—326 R 21 Claims

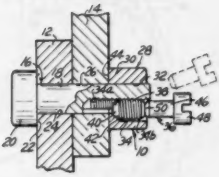


1. An apparatus for shaping the edges of a wood paneling board having a pair of opposing end edges and a pair of opposing side edges, comprising:
(a) first shaping means for cutting a first shape in a first end edge and a first side edge of said board, sequentially, as said board is moved past said first shaping means in contact therewith;
(b) input carriage means for supporting said board and moving said first end edge thereof past said first shaping means in contact therewith, thereby shaping said first end edge;
(c) second shaping means for cutting a second shape in a second side edge and a second end edge of said board, sequentially, at it moves past said second shaping means in contact therewith;
(d) feed means for moving said first side edge of said board past said first shaping means in contact therewith, thereby shaping said first side edge, and for moving said second side edge of said board past said second shaping means in contact therewith, thereby shaping said second side edge; and
(e) output carriage means for supporting said board and moving said second end edge of said board past said second shaping means in contact therewith, thereby shaping said second end edge.

4,082,130
FASTENING MEANS

Jakob Rech, Detroit, Mich., assignor to Sheldon H. Applefield and Jerome H. Applefield, both of Southfield, Mich., part interest to each

Continuation-in-part of Ser. No. 692,888, Jun. 4, 1976, abandoned. This application Dec. 22, 1976, Ser. No. 753,517
Int. Cl.[2] F16B *19/00, 39/06*
U.S. Cl. 151—23 11 Claims



1. In combination, a female member and a male member including means for adjustably fastening said female member which is provided with a cylindrical first bore having a substantially smooth surface to said male member which is provided with a cylindrical body slidably engaged in said first bore, said means comprising a partially threaded circularly cylindrical second bore having an axis substantially parallel to the axis of said cylindrical body, said partially threaded second bore having an unthreaded portion extending transversely part of the way into said first bore surface and extending longitudinally from an end face of said female member to part of the way to the other end face of said female member and a threaded portion extending transversely part of the way into said male member body having a length appreciably greater than the length of said unthreaded bore portion, and a threaded member threadably engaged in said partially threaded second bore, said threaded member having an end engageable with abutment means defined by the end of said partially threaded second bore unthreaded portion, whereby rotation of said threaded member in the direction engaging the end thereof with said abutment means displaces said female member relative to said male member in one direction.

4,082,131
TIRE TREAD STRUCTURE

James I. Scheller, 18905 SW. Blamon Ct., Aloha, Oreg. 97005

Continuation-in-part of Ser. No. 477,894, Sep. 11, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,123
Int. Cl.[2] B60C *11/14*
U.S. Cl. 152—210 1 Claim

1. A tire tread structure comprising a base composition of rubber or the like and garnet particles intermixed in the rubber composition, said garnet particles having a naturally irregular, multiple sided configuration with a plurality of sharpened protruding edges, whereby the irregular shape of said particles holds said particles in the tire tread with portions thereof protruding from the road engaging surface of the tire tread to engage the road surface and add traction between the tire and the road, the amount of garnet particles in said tread structure being at least 10% by weight relative to the weight of the

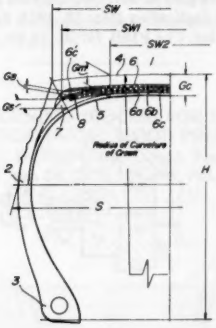
rubber composition, said garnet particles ranging in size from 177 to 841 microns.

4,082,132

LOW SECTION PROFILE PNEUMATIC RADIAL TIRE FOR HEAVY VEHICLES

Tatsuo Arai, Fuchu; Hironori Hirano, Akigawa; Hiroyuki Kajimura, Higashi-Murayama, and Masayuki Matsui, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan

Filed Oct. 4, 1976, Ser. No. 729,240
Claims priority, application Japan, Oct. 2, 1975, 50-118234
Int. Cl.² B60C *9/18*
U.S. Cl. 152—361 R **5 Claims**



1. A low section profile radial tire for heavy vehicles the cross-sectional configuration uninflated defined in a metal mold of which has an aspect ratio of smaller than 0.85 and a crown flatness of larger than 2.0 and which comprises a carcass formed by plies, a number of cords of which lie in a substantially radial plane, a belt formed by a plurality of inextensible layers and superimposed about said carcass and extending over substantially the total width of a crown of a tread portion of the tire, and a cushion rubber inserted between said carcass and belt, said tire constructed to satisfy the following conditions:
   1. the thickness of the tread portion which extends along the crown region is substantially uniformly distributed over 35–60% of the maximum width of the inextensible layers which comprise a tension member of said belt,
   2. said cushion rubber formed of a rubber stock triangular in cross section having a thickness arranged outside both sides of the center region of the crown, said cushion rubber gradually increasing the thickness of the tread portion toward the hump portion of the tire, and
   3. the thickness of said cushion rubber limited to a range of 25–50% of the thickness of that tread portion which is located at the crown center position, the thickness of said cushion rubber being defined by a distance from the the end of the inextensible layer having the maximum width to the carcass, the distance being measured on a normal line which is drawn from the end of the inextensible layer having the maximum width perpendicular to the carcass ply.

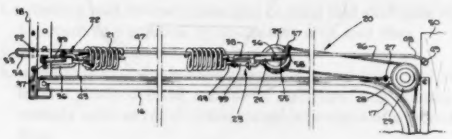
4,082,133

SECTIONAL GARAGE DOOR SPRING CONTAINER

William Halopoff, 17720 Crusader St., Cerritos, Calif. 90701

Continuation-in-part of Ser. No. 692,340, Jun. 3, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,561
Int. Cl.² E05F *11/00*
U.S. Cl. 160—191 **5 Claims**

1. In a sectional garage door assembly for a building structure comprising a door opening supporting a vertical track section on each side of the opening and a horizontal overhead section of each track section extending between a front end at said vertical track section to a rear end, a door with opposite side edges slidably mounted in the respective track sections for movement between a vertical closed position and a horizontal open position, and a counterbalance spring assembly for said door comprising a coil spring mounted for action in tension and parallel to and adjacent said horizontal overhead section, said spring having a rear hook up at the rear end to the structure, a movable pulley, and a forward hook up between said pulley and the forward end of the spring, a second stationary pulley mounted on the structure adjacent said vertical track section, and a cable extending over said pulleys and having one end anchored to said structure and the other end attached to the door, the combination of a spring containment device comprising a single length of rod extending through the spring and having a forward attachment at a forward end directly to the structure adjacent said vertical track section and a rearward attachment at the rearward end directly to the structure adjacent the rear hook up, said rod having a length in excess of the distance between the mounting of the stationary pulley on the structure and the rear hook up for said spring to the structure whereby foreward and rear portions of the rod protrude outward beyond the respective end of the spring, a carrier for said movable pulley having a portion in interlocked sliding engagement with said rod, said rear hook up comprising a releasable interlocked connection between the spring and the structure, said forward hook up comprising a releasable interlocked connection between the spring and the carrier and cushioning means for absorbing shock from a ruptured spring comprising a part of one of said portions of the rod adjacent the structure at one of the ends of the rod said part having the form of a loop extending laterally relative to that part of the rod which lies within the spring, whereby material of the rod comprises the cushioning means to absorb the shock.



4,082,134

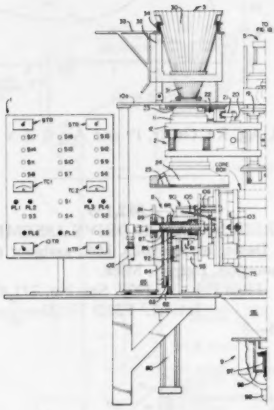
COMBINED SAND CORE MACHINE

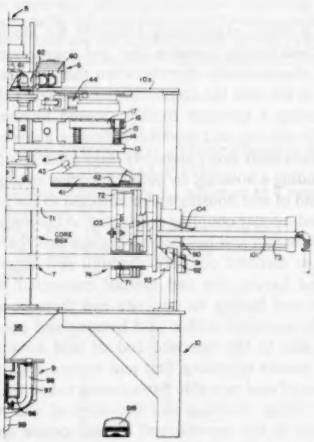
William A. Zachary, Walled Lake, Mich., assignor to International Minerals & Chemical Corporation, Detroit, Mich.

Filed Oct. 27, 1976, Ser. No. 735,950
Int. Cl.² B22C *13/00, 13/08*
U.S. Cl. 164—157 **30 Claims**

1. A machine for producing rigid sand cores to be used in metal casting from a molding mixture comprising a refractory granular material such as sand and a relatively small quantity of a hardenable binder, said machine comprising in combination:
   - a frame;
   - a core box having at least one opening therein for receiving the molding mixture;
   - support means mounted on said frame supporting said core box;
   - depositing means mounted on said frame adjacent said opening in said core box for depositing the molding mixture in said core box;
   - shell core producing means for producing hollow shell cores from the molding mixture in said core box, said shell core producing means including draining means forming part of said support means for rotating said core box to drain excess molding mixture from said core box in order to leave a thin coating of the molding mixture in said core box and heating means mounted on said support means adjacent said core box for heating said core box to cure the molding mixture in said core box;

cold box core producing means for producing cold box cores from the molding mixture in said core box, said cold box core producing means including gas means mounted on said frame to engage said core box for passing gas through said core box to cure the molding mixture in said core box and purging means connected to said gas means for purging the gas in said core box;





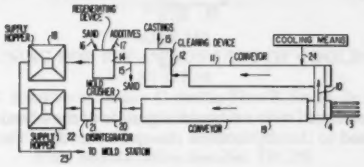
programmable control circuit means operative for automatically operating said shell core producing means and said cold box core producing means, said programmable control circuit means including selector switch means positionable for selecting one of said shell core producing means or said cold box core producing means for automatic operation to enable said machine to produce either shell cores or cold box cores during any one automatic cycle.

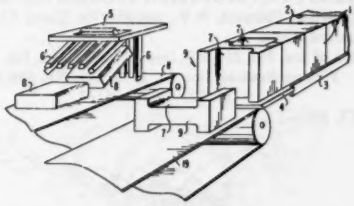
4,082,135

FOUNDRY APPARATUS FOR THE SEPARATION OF CASTINGS FROM CASTING MOULDS

Carl Herbert Petersen, Vaerlose, and Marius Gunnergaard, Lyngby, both of Denmark, assignors to Dansk Industri Syndikat A/S, Herlev, Denmark

Division of Ser. No. 438,366, Jan. 31, 1974, Pat. No. 3,958,619. This application Jan. 30, 1976, Ser. No. 653,900
Claims priority, application Denmark, Feb. 6, 1973, 631/73
Int. Cl.[2] B22D *29/00, 17/22*
U.S. Cl. 164—404 **4 Claims**





1. Foundry apparatus for two stage separation of castings from casting moulds, comprising:

a support for the stepwise advance of the moulds to a cutting and separation station;

cutting means located at said cutting and separation station for cutting out a lump of mould material encasing a casting and for separating said lump from the remaining mould parts;

a first conveyor adjacent said cutting and separation station for receiving said remaining mould parts from said cutting and separation station and for delivering said remaining mould parts to a mould crusher;

a second conveyor adjacent said cutting and separation station for receiving said lump and for delivering said lump to a castings cleaning device; and

means connected to said cutting means for translating said cutting means between said cutting and separating station and said second conveyor for the purpose of delivering said lump to said second conveyor for delivering said lump from said cutting means to said second conveyor.

4,082,136

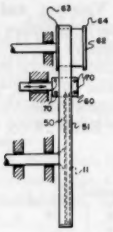
CASTING MACHINE WITH TRANSLATABLE BAND

Yves B. Bonnamour, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Nov. 15, 1976, Ser. No. 741,829
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—433 **6 Claims**

1. A rotary casting machine for continuously casting molten metal comprising a rotatable casting wheel having a peripheral groove, an imperforate endless band guided into closed relationship with an arcuate portion of said peripheral groove to form a molten metal casting mold, said endless band having a lateral width substantially greater than the width of said casting wheel and means operatively associated with said casting wheel and band for laterally moving said band and casting wheel relatively of each other so as to contact said arcuate portion of said wheel with different lateral surface areas of said

band whereby thermalcracks in the band caused by prolonged contact of the band with the molten metal in the casting mold



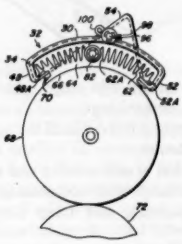
are distributed over a substantial portion of the lateral width of the band to thereby increase the operative life of the band.

4,082,137

METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING IN AN ELECTROSTATOGRAPHIC MACHINE

Karl Mueller, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 214,305, Dec. 30, 1971, Pat. No. 3,493,124.
This application Jun. 16, 1976, Ser. No. 696,468
Int. Cl.² G03G *15/12*
U.S. Cl. 165—1 **8 Claims**



1. The method of cooling a fuser assembly including a fuser roller and a pressure roller, the steps which comprise

placing heat transfer means in heat exchange relation with said pressure roller of said assembly

positioning an enclosure about said heat transfer means to form in cooperation with said heat transfer means a zone, said zone having an inlet and an outlet means thereto;

passing a heat transfer fluid through said zone about said heat transfer means; and

withdrawing said fluid from said zone to cool said fuser assembly fuser and pressure rollers.

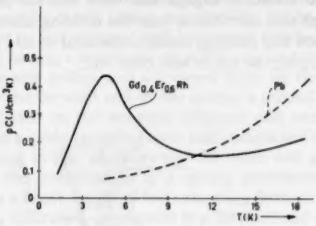
4,082,138

HEAT REGENERATOR

Andries Rinse Miedema; Kurt Heinz Jürgen Buschow, and Jan Mulder, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1975, Ser. No. 607,793
Claims priority, application Netherlands, Sep. 2, 1974, 7411601
Int. Cl.² C09K *5/00*; F28D *17/00*
U.S. Cl. 165—4 **1 Claim**

1. In a low-temperature regenerator comprising a filling mass of a heat accumulating material in a housing the improvement wherein the heat accumulating material has a relatively high specific heat at temperatures below 20° K and is formed of at least one compound of the formula $A_{1-x}B_xRh_{1-y}X_y$, wherein A is at least one element selected from the group consisting of Sm, Gd, Tb and Dy, B is at least one element selected from the group consisting of Ho, Er, Tm and Yb, X is at least one element selected from the group consisting of Cu,



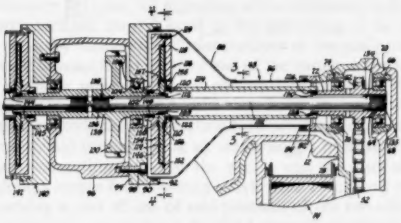
Zn, Ru, Pd, Ag, Re, Os, Ir, Pt and Au, $0 \leqq x \leqq 1$ and $0 \leqq y < 0.2$.

4,082,139

REGENERATOR DRIVE ASSEMBLY

Leonard C. Davis, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1977, Ser. No. 771,475
Int. Cl.² F28D *19/00*
U.S. Cl. 165—8 **4 Claims**



3. In a rotary regenerator assembly for use in gas turbine engines and having a matrix disc and regenerator seal with a friction characteristic therebetween that excites torsional vibration in the disc the combination of a matrix disc hub drive shaft having a sprocket fixedly secured to one end thereof, means for driving said sprocket including a driven roller chain and a cross shaft drive assembly, said cross shaft drive assembly including a housing, an output sprocket rotatably journaled at one end of said housing and connected to the roller chain, an elongated tubular coupling connected to the output sprocket at one end thereof and having an opposite end thereon, a torsion spring bar directed coaxially through said outer tubular coupling and having one end thereof connected to said output sprocket and having an opposite end thereon, an input shaft rotatably journaled within said housing and connected coaxially of and to the opposite end of said torsion spring bar, damper means including first and second relatively movable parts one of said movable parts connected to the opposite end of said tubular coupling and the other of said movable parts connected to the opposite end of said torsion spring bar, said first and second movable parts of said damper means having viscous fluid interposed therebetween and being operative in response to differential motion between the input shaft and the output sprocket to produce a positive damping torque to oppose matrix disc oscillations produced by friction between the rotary matrix disc and the regenerator seal, said first and second parts of said damper means being installed in parallel with said torsion spring bar with said spring bar transferring drive torque from the input shaft to the matrix disc shaft and also being flexed in response to friction induced vibration to produce a differential motion required for damper means operation.

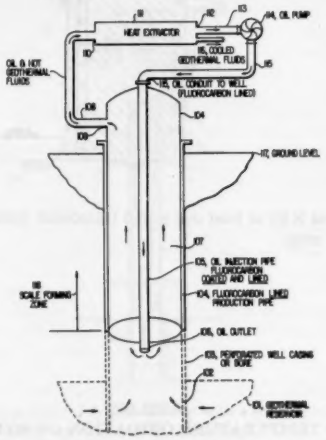
4,082,140
HEAT EXCHANGE METHOD

Ransome W. Erwin, Holtville, Calif., assignor to Austral-Erwin Engineering Company, Houston, Tex.

Continuation-in-part of Ser. No. 306,183, Nov. 14, 1972, Pat. No. 3,891,496, and Ser. No. 581,849, May 29, 1975, abandoned, which is a division of Ser. No. 306,183,. This application Jun. 20, 1975, Ser. No. 588,797

Int. Cl.² F28F *13/18;* B01D *3/34*

U.S. Cl. 165—45 **27 Claims**



1. The improvement in the method of extracting heat from mineralized aqueous fluids through a wall without adherence of precipitated mineral solids to fluid contacting surfaces of the apparatus in which the method is carried out; which improvement consists in that the cooling of the said mineralized fluid takes place in apparatus wherein the fluid contacting surfaces are (1) preferentially oil wettable and (2) substantially zero water adsorbent and are (3) continuously wetted with an organic liquid which is immiscible with the aqueous fluid being cooled.

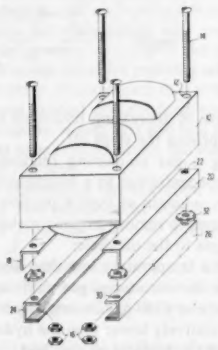
4,082,141
BALLAST VIBRATION ISOLATION SYSTEM WITH THERMAL PATH

Michael L. Perretta, Manlius, N.Y., assignor to Crouse-Hinds Company, Syracuse, N.Y.

Filed Feb. 18, 1976, Ser. No. 658,962

Int. Cl.² F28F *7/00;* H01F *27/08*

U.S. Cl. 165—69 **3 Claims**



1. A ballast vibration isolation system having a thermal path comprising ballast means, mounting plate means, first heat transfer means secured to said ballast and having at least one flat surface extending outwardly at right angles thereto, second heat transfer means secured to said mounting plate means and having at least one flat surface extending outwardly therefrom at right angles, means securing said first and second heat transfer means together with said flat surfaces being disposed in intimate sliding contact with each other to provide a thermal path between said ballast means and said mounting plate means and vibration isolation means disposed between said ballast means and said mounting plate means.

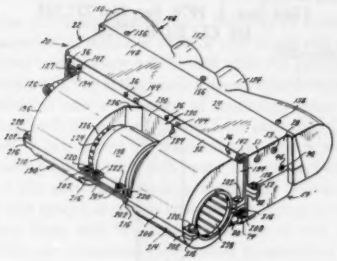
4,082,142
HOUSING FOR EXPANSION UNIT OF COOLING SYSTEM

James R. Blackburn; Dudley C. Smith; Theo B. Smith, Jr., all of Dallas, and Jerry N. Morgan, Mesquite, all of Tex., assignors to John E. Mitchell Company, Dallas, Tex.

Filed Sep. 24, 1976, Ser. No. 726,250

Int. Cl.² F28F *7/00*

U.S. Cl. 165—76 **28 Claims**



1. A housing, for an expansion unit of a cooling system, which has a bottom wall, a top wall, and end walls, said walls coacting to define a space within said housing which is dimensioned to accommodate said expansion unit, and an air-guiding member at one side of said housing, said air-guiding member having a partition thereon intermediate two scrolls for multivane blowers, said partition having those edges thereof which are adjacent said scrolls relieved to enable air, which exits from said scrolls, to move toward the longitudinal center of said partition as it passes from said air-guiding member into said space within said housing.

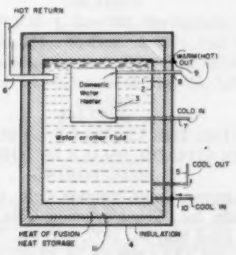
4,082,143
SOLAR ENERGY

Harry E. Thomason, 609 Cedar Ave., Fort Washington, Md. 20022

Filed Apr. 27, 1976, Ser. No. 680,672

Int. Cl.² F28D *21/00*

U.S. Cl. 165—104 S **3 Claims**



1. Heat or cold storage apparatus comprising a first outer container, a second container in said first container, a third

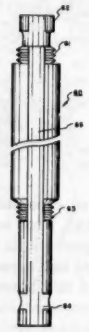
tank-like container in said second container, insulation means to reduce heat or cold transfer into or out from said first outer container, heat-of-fusion heat storage material substantially filling the space between said first and said second containers, conduit means connected to said third container to introduce liquid to be heated or cooled and to provide for exit of such liquid, and conduit means connected to said second container to provide for: A. introduction of liquid and exit of liquid for heat or cold storage purposes; and B. exit of and return of liquid for removal of heat or cold from storage.

4,082,144

METHOD AND APPARATUS FOR RUNNING AND RETRIEVING LOGGING INSTRUMENTS IN HIGHLY DEVIATED WELL BORES

Gerald L. Marquis, London, England, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 1, 1976, Ser. No. 737,748
Int. Cl.[2] E21B *47/00*
U.S. Cl. 166—250 **7 Claims**



1. A method for logging the formations surrounding an earth borehole, comprising:

attaching a well logging instrument to a well logging cable;

attaching a plurality of tubular extensions to each other end to end, the lower one of said extensions being connected to said instrument, each of said extensions having a slot along its entire length to allow said cable to be placed within said extensions as said extensions are being connected together; and

causing said instrument and said plurality of extensions to traverse said borehole and to log at least a portion of the formations surrounding said borehole.

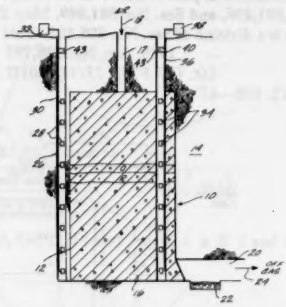
4,082,145

DETERMINING THE LOCUS OF A PROCESSING ZONE IN AN IN SITU OIL SHALE RETORT BY SOUND MONITORING

W. Brice Elkington, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed May 18, 1977, Ser. No. 798,076
Int. Cl.[2] E21B *43/24, 45/00, 47/12*
U.S. Cl. 166—251 **31 Claims**

15. A method for determining the locus of a processing zone advancing through a fragmented permeable mass of particles in an in situ oil shale retort in a subterranean formation containing oil shale, the method comprising the step of monitoring for sound produced in the processing zone, wherein monitoring



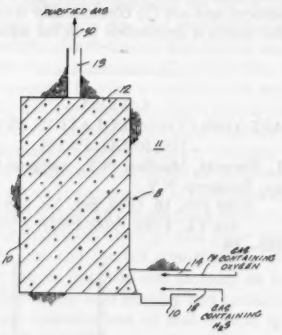
for sound is by at least one sound transducer within the fragmented mass.

4,082,146

LOW TEMPERATURE OXIDATION OF HYDROGEN SULFIDE IN THE PRESENCE OF OIL SHALE

Leslie E. Compton, Claremont, and William H. Rowan, Torrance, both of Calif., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Mar. 24, 1977, Ser. No. 780,928
Int. Cl.[2] E21B *43/24, 43/26;* E21C *41/10;* B01J *8/02*
U.S. Cl. 166—259 **41 Claims**



4. A method of decreasing hydrogen sulfide concentration of a gas comprising the steps of:

introducing a gas containing relatively higher hydrogen sulfide concentration to a fragmented permeable mass of oil shale, wherein at least a portion of the oil shale has been treated to remove organic material prior to introducing the gas to the oil shale;

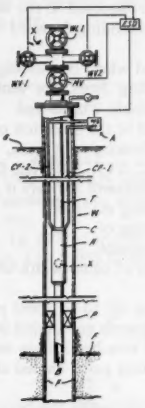
reacting at a temperature less than about 650° F hydrogen sulfide in the introduced gas with oxygen in the presence of oil shale to yield gas having a hydrogen sulfide concentration relatively lower than the hydrogen sulfide concentration of the introduced gas; and

withdrawing such gas having a relatively lower hydrogen sulfide concentration from the fragmented permeable mass of oil shale.

4,082,147
METHOD AND APPARATUS FOR A SURFACE CONTROL SYSTEM FOR: SUBSURFACE SAFETY VALVES

Danny K. Wolff; James D. Mott, and Kenneth W. Colvin, all of Houston, Tex., assignors to Hydril Company, Tex.

Filed Feb. 24, 1977, Ser. No. 771,465
Int. Cl.[2] E21B *43/00, 33/03*
U.S. Cl. 166—314 16 Claims



1. A surface control system for use with a surface controlled subsurface safety valve in a well, including:

a controller housing;

means with said controller housing for communicating with a supply of fluid under pressure for powering the surface controller system;

means with said controller housing for communicating with an emergency shut down signal for the well thereto;

means with said controller housing for communicating with a first control fluid conduit that operably communicates with the subsurface safety valve;

means with said controller housing for communicating with a second control fluid conduit that operably communicates with the subsurface safety valve for balancing the hydrostatic head of the control fluid in the first control fluid conduit;

controller valve means mounted in said controller housing valve means for selectively communicating said first control fluid conduit with said second control fluid conduit; and

means responsive to the presence of an emergency shut down signal for maintaining said controller valve means in a closed position blocking communication of said first control fluid conduit and said second control fluid conduit, said means for maintaining said controller valve means in a closed position operable in the absence of said emergency shut down signal for enabling said valve means to open and thereby communicate said first control fluid conduit with said second control fluid conduit wherein control fluid pressure in said first and said second control fluid conduits is equalized to enable the subsurface safety valve to shut in the well.

12. A method of controlling the operation of a subsurface safety valve having two independent control fluid passages extending upwardly from the valve to a surface controller including the steps of:

increasing the control fluid pressure in one of the two independent control fluid passages to provide a pressure differential to open the subsurface safety valve to enable flow from the well;

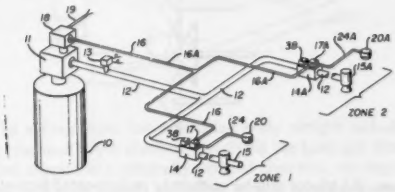
interrupting a reference signal to the surface controller in response to the sensing of an undesired condition; and

communicating the independent control fluid passages at the surface control to equalize the pressure differential in the control fluid passages to enable the subsurface safety valve to close.

4,082,148
FIRE PROTECTION SYSTEM

Charles F. Willms, Rutherford, N.J., assignor to A-T-O Inc., Willoughby, Ohio

Filed Jul. 26, 1976, Ser. No. 708,491
Int. Cl.[2] A62C *37/04, 37/06*
U.S. Cl. 169—61 3 Claims



1. A fire protection system for a plurality of zones comprising a temperature sensor in each of said zones and responsive to a critical temperature within said zone for providing a signal, a source of a fire extinguishing agent, distribution arranged in a main line and a plurality of secondary lines extending therefrom, each of said secondary lines extending into one of said zones, a first means for connecting said source of said fire extinguishing agent with said main line of said distribution piping, a plurality of secondary means for individually connecting said main line of said distribution piping to one of said secondary lines, said first means and one of said secondary means being simultaneously responsive in operation to a signal provided by one of said temperature sensors in one of said zones whereby said fire extinguishing agent is directed only to said one zone in which said sensor signals a critical temperature and wherein said secondary means comprises individual selector valves, each of which has a cylindrical body with inlet and outlet ends, a first valve element arranged for movement toward and away from a valve seat in said cylindrical body adjacent said outlet end thereof, spring means biasing said first valve element toward said valve seat, an annular chamber in said annular body, an annular collar on said valve element engaging said cylindrical body in said annular chamber, at least one passageway extending between said inlet end of said cylindrical body and said annular chamber, a secondary valve in said passageway in connection with one of said temperature sensors whereby opening said secondary valve permits the fire extinguishing agent to flow into said annular chamber and move said valve element to open position.

4,082,149
POWER CULTIVATOR WITH RECIPROCATING BLADES

Paul A. Grobey, R.F.D. 1, Box 586, Springfield, Vt. 05156

Division of Ser. No. 515,379, Oct. 16, 1974, Pat. No. 3,982,593, which is a continuation-in-part of Ser. No. 461,085, Apr. 15, 1974, abandoned. This application May 24, 1976, Ser. No. 689,618
Int. Cl.[2] A01B *39/10*
U.S. Cl. 172—40 4 Claims

1. A power cultivator comprising:

(1) a body;

(2) wheel means supporting said body during normal use;

(3) motor means having a drive shaft mounted on said body;

(4) a follower member extending transversely to the direction of travel of said cultivator;

(5) a parallelogram linkage connecting said follower member to said body;

(6) transmission means coupling said drive shaft to said

follower member for reciprocating said follower member substantially perpendicular to the direction of travel of said cultivator;

(7) a plurality of blades, each having a pair of intersecting working edges;

(8) connecting means fixedly connecting each of said blades to said follower member such that when said cultivator is operated over the surface of the ground during normal

use, the blades will be uniformly reciprocated beneath the soil for loosening the soil and pulling the weeds out without cutting off their roots; and

(9) each of said blades having said working edges extending rearwardly and laterally relative to the direction of travel, with the working edges of said blades overlapping whereby roots of plants draped about said working edges will move rearwardly and laterally along said working edges, and eventually drop completely off said blade.

4,082,150

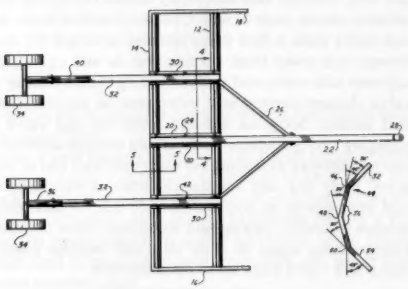
LAND LEVELLING EQUIPMENT

Dwayne L. Winkles, P.O. Box 401, Farwell, Tex. 79325

Filed Apr. 14, 1977, Ser. No. 787,349

Int. Cl.[2] E02F 3/64

U.S. Cl. 172—780 **5 Claims**



1. In a land leveler to be pulled in a direction of draft having
a. side plates aligned with the direction of draft on each side thereof,
b. front and back moldboard carriers normal to the direction of draft rigidly connected to the side plates,
c. the side plates extending forward of the front moldboard carrier,
d. widely separated wheel booms aligned with the direction of draft extending from the moldboard carriers rearwardly to adjustable wheels, and
e. a tongue aligned in the direction of draft from the moldboard carriers forward to a hitch;

THE IMPROVED STRUCTURE COMPRISING:

f. vertical upward tongue guides aligned with the direction of draft, rigidly connected to the top of the moldboard carriers,
g. said tongue bolted within the tongue guides, and
h. vertical upward boom guides aligned with the direction of draft rigidly connected to the top of the moldboard carriers,
j. said booms bolted within said boom guides, and
k. said vertical upward guides being angle irons welded to the front moldboard carrier and also to the rear moldboard carrier and extending therebetween.

5. In a land leveler to be pulled in a direction of draft having
a. side plates aligned with the direction of draft on each side thereof,
b. front and back moldboard carriers normal to the direction of draft rigidly connected to the side plates,
c. the side plates extending forward of the front moldboard carrier,
d. widely separated wheel booms aligned with the direction of draft extending from the moldboard carriers rearwardly to adjustable wheels and
e. a tongue aligned in the direction of draft from the moldboard carriers forward to a hitch,

THE IMPROVED STRUCTURE COMPRISING:

f. each of said moldboard carriers is a channel beam,
g. a moldboard being made of
(i) an integral plate of
(ii) four planar panels,
(iii) each panel is of equal width and length to each other panel and
(iv) angled about 30° to adjacent panel so that
(v) the outside panels are angled 90° to each other,
h. said moldboard attached within the carrier channel with the top and bottom panel angled about 45° from vertical, and
j. a scraper blade bolted to the bottom panel of the moldboard.

4,082,151

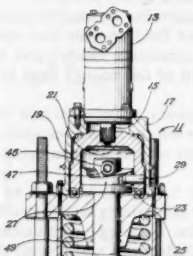
CAM MOUNTING FOR AN IMPACT TOOL

James L. Finney, Cranbury, N.J., assignor to Hughes Tool Company, Houston, Tex.

Filed Jan. 14, 1977, Ser. No. 759,502

Int. Cl.[2] B25D 9/00

U.S. Cl. 173—119 **6 Claims**



1. In a motor driven cam and spring means impact tool having a housing, a driving shaft mounted in the housing for rotation relative to the housing, a hammer positioned in the housing for axial movement with respect to the driving shaft, an annular camming assembly having components including a cam and a pair of cam rollers mounted on opposite sides of the hammer for translating rotational motion of the driving shaft to reciprocal motion of the hammer, and transmission means connected to the driving shaft and to the camming assembly to

rotate one of the components with respect to the other, the non rotating component being attached to the hammer, and improved mounting for the cam comprising:

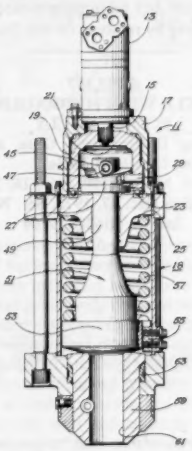
a pair of pins each having one end inserted in a bore in the cam formed transverse to the axis of the driving shaft, the other end carried selectively by the transmission means and the hammer, the pins being spaced apart 180° and each having at least one of its ends slidingly received; the cam being mounted in the housing so that it is free to tip about the axis of the pins to equalize the load imposed by the cam rollers on the cam.

4,082,152

CAM MOUNTING FOR AN IMPACT TOOL

Billie J. Whitworth, Pasadena, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jan. 14, 1977, Ser. No. 759,503
Int. Cl.[2] B25D *9/00*
U.S. Cl. 173—119 **3 Claims**



1. In a motor driven impact tool having a housing, a driving shaft mounted in the housing for rotation relative to the housing, a hammer positioned in the housing for axial movement with respect to the driving shaft, an annular cam with an inclined camming surface, a pair of cooperating cam rollers to translate rotary motion of the driving shaft to reciprocal motion of the hammer, and a spring urging the hammer in one direction to provide an impact, an improved cam mounting comprising:

a cylindrical collar, having its closed end connected to the driving shaft, its walls encircling the cam and connected to the cam by a pair of pins inserted in apertures formed in the cam transverse to the axis of the driving shaft and spaced apart substantially 180°;

an axle mounted transverse to one end of the hammer and immovable with respect to the hammer, the cam rollers being mounted on each end of the axle and in contact with the camming surface for causing the hammer to reciprocate as the cam is rotated ;

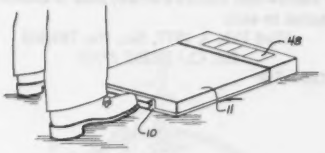
the apertures in the cam which the pins are inserted being circumferentially elongated so as to allow the cam to move a selected distance with respect to the pins in a plane substantially normal to the axis of the driving shaft for creating backlash.

4,082,153

DIGITAL TYPE FLOOR SCALE WITH WEIGH CYCLE CONTROL

Mike A. Provi, Rockford, Ill., assignor to The Brearley Company, Rockford, Ill.

Filed Mar. 2, 1977, Ser. No. 773,389
Int. Cl.[2] G01G *23/30, 3/14*
U.S. Cl. 177—177 **8 Claims**



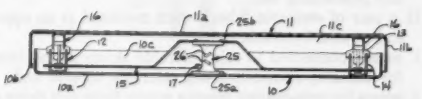
1. In a floor scale for measuring body weight including a scale base and a foot platform overlying the base and movable relative thereto in a generally vertical direction, an electronic digital weighing system including weight sensing means and digital display means responsive to said weight sensing means for producing a digital display indicative of the weight applied to the scale platform, and power means for said electronic digital display system, the improvement comprising a weigh cycle control including a kick member mounted on said scale base at one side thereof for movement relative thereto in a generally horizontal direction and adapted to be actuated by the foot of a person before stepping on the foot platform, a momentary contact switch means mounted on the scale base for actuation by the kick member and timed switch means actuated by said momentary contact switch means for controlling application of power from said power means to said electronic digital display system, said timed switch means including means operative in response to actuation of the momentary contact switch means for initiating application power from said power means to said electronic digital display means, and timer means operative to continue the application of power to said electronic digital weighing system for a preselected time interval sufficient for a weighing operation.

4,082,154

WEIGHING SCALE APPARATUS

Vernon J. Pillote, Rockford, Ill., assignor to The Brearley Company, Rockford, Ill.

Filed Mar. 17, 1977, Ser. No. 778,495
Int. Cl.[2] G01G *3/14, 3/00*
U.S. Cl. 177—211 **25 Claims**



1. A weighing scale apparatus comprising: a base scale member and a platform scale member spaced from the base scale member, a plurality of bell cranks, each having a pivot axis, bell crank pivot means mounting the several bell cranks on one of said scale members at locations angularly spaced apart about a common center for pivotal movement in planes having at least a substantial component tangent to a circle about said common center, a load summing member adapted for turning about said common center, means connecting the several bell cranks at locations vertically offset from the respective pivot axis to said load summing member at angularly spaced locations thereon for turning the load summing member about said common center, means connecting the other of said scale members to each of said cell cranks at locations horizontally offset from the pivot axes of the bell cranks in the same angular direction relative to said common center to apply a turning

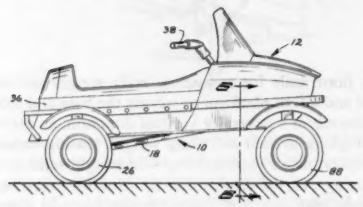
moment to said load summing member correlative with the load on the scale platform member, and means for sensing the turning moment applied to the load summing member as an indication of the load on the platform scale member.

4,082,155

WHEELED UNDERCARRIAGE FOR SNOWMOBILES

Clyde B. McCartney, Big Stone City, S. Dak., assignor to Wayne Parrow and Harold Parrow, both of Delworth, Minn., part interest to each

Filed Feb. 3, 1977, Ser. No. 765,408
Int. Cl.² B62M *27/00*
U.S. Cl. 180—5 R **9 Claims**



1. A wheeled undercarriage for use with a snowmobile having a body provided with an endless drive track assembly tunnel, a drive shaft in said tunnel, a steerable ski-mounting bracket and another ski-mounting bracket each extending from spaced apart forward portions of the body, said undercarriage including:

A. an undercarriage positioning bar mounted to the snowmobile body inside of the tunnel;

B. a rear wheel support frame rotatably mounted at a forward portion thereof to said positioning bar in approximate alignment with the longitudinal center of the snowmobile body, said support frame having a rear axle casing at a rear portion thereof;

C. a rear axle in said casing;

D. a pair of rear wheels each supported on an opposite end of said rear axle for rotation therewith;

E. a pair of resilient suspension assemblies each supporting one side of a rear portion of said snowmobile body on a portion of said rear support frame adjacent said rear axle casing;

F. a means for restricting transverse movement of said snowmobile body with respect to said rear wheels and rear axle casings;

G. a front axle bolster mounted with respect to the snowmobile body at the ski-mounting brackets and connected to said positioning bar;

H. a pair of steerable wheels each mounted at an opposite end of said front axle bolster;

I. means connected to said steerable ski-mounting bracket for steerably controlling said steerable wheels; and

J. means for transmitting driving power from said drive shaft to said rear axle shaft.

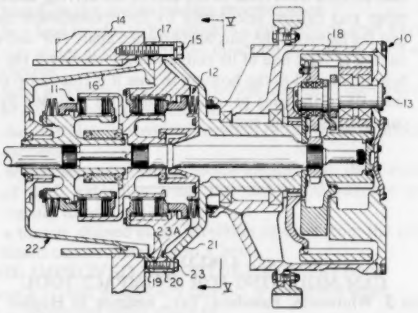
4,082,156

DRIVE MECHANISM HAVING SEPARABLE HOUSING

Ronald L. Krolak, Morton; George W. Cackley, Hanna City; Marvin G. Getz, Morton, and Arthur J. Ritter, Jr., Metamora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 1, 1976, Ser. No. 701,704
Int. Cl.² B62D *55/12*
U.S. Cl. 180—9.62 **8 Claims**

1. In a drive mechanism having a mounting support, a steering clutch assembly formed of a plurality of coaxial subassemblies, a brake assembly formed of a plurality of subassemblies, and a final drive assembly, the improvement comprising: a first housing for housing said steering clutch assembly and defining a first annular flange; a second housing for housing said brake assembly and defining a second annular flange; a third housing for mounting said final drive assembly and defining a third annular flange; removable first securing means arranged in an annular array coaxially of said subassemblies for securing said



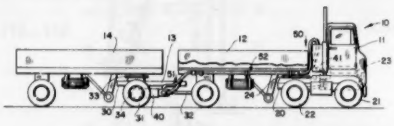
housing flanges coaxially together to cause said housings to define a unitary housing for said mechanism; and removable second securing means for securing the unitary housing from said mounting support and permitting subsequent disassembly of said unitary housing by removal of said first securing means.

4,082,157

HIGHWAY VEHICLE WITH HYDRAULICALLY DRIVEN POWER DOLLY

Ernest R. Sternberg, Rocky River, Ohio, assignor to White Motor Corporation, Cleveland, Ohio

Continuation of Ser. No. 199,290, Nov. 16, 1971, abandoned.
This application Dec. 17, 1973, Ser. No. 425,207
Int. Cl.² B62D *59/04*
U.S. Cl. 180—14 A **10 Claims**



1. A hydrostatic assist drive for a tractor trailer which drives the wheels of the trailer to assist the main tractor drive, comprising:

(a) a hydraulic pump unit;

(b) a hydraulic motor unit;

(c) conduit means for conveying fluid from the pump to the motor;

(d) means for varying the displacement of one of said units;

(e) a shiftable plural range axle drive between the trailer wheels and driven by said motor unit; and

(f) control means for shifting said axle to select the drive range of the axle drive.

4,082,158

DIFFERENTIAL PRESSURE POWER ROAD SPEED CONTROL SYSTEM

John A. Carol, Jr.; Wayne E. Paxton, both of Flint, and John W. Riddel, Fenton, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1975, Ser. No. 632,398
Int. Cl.² B60K *31/00*
U.S. Cl. 180—108 **5 Claims**

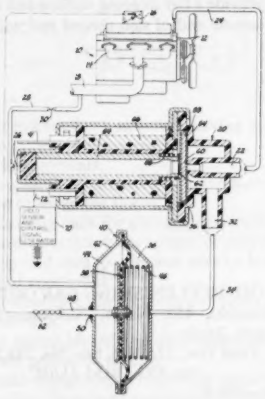
1. In an engine power control mechanism selectively maintaining a desired engine output,

a system for operating a differential pressure operated servomotor by separate first and second pressures generated to

maintain a substantially constant pressure differential therebetween throughout an operating range of engine load, said system comprising:

an engine having a control device controlling engine speed and power, said engine generating separate fluctuating first and second pressures having a substantially constant pressure differential therebetween throughout an operating range of engine load;

a servomotor having a housing, a power wall movable in said housing and dividing said housing into first and second power pressure chambers, an output member connected to said power wall and movable thereby and also connected to said engine control device to control said engine to modify engine power under selectively predetermined conditions to maintain a desired engine output;



first means connecting said first pressure to said first power chamber and having a restrictive orifice therein;

and second means including a pressure varying device responsive to said selectively predetermined conditions and to changing engine operating load demands to generate a controlled pressure from said first and second pressures, said second means connecting said controlled pressure to said second power chamber whereby said servomotor is actuated in accordance with the pressure differential across said power wall and controls the output of said engine by varying engine power to meet the changing engine operating load demands and maintain the desired engine output.

4,082,159

CERAMIC SPEAKER ENCLOSURE

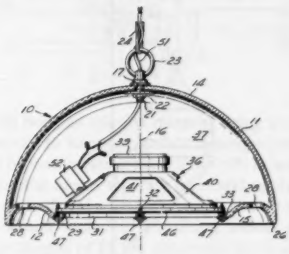
Frank Petty, Paris, Tenn., assignor to Mar-Kel Lighting, Inc., Paris, Tenn.

Filed May 24, 1976, Ser. No. 689,154

Int. Cl.[2] H05K *5/00;* **G10K** *13/00;* **A47B** *81/06*

U.S. Cl. 181—156 **3 Claims**

1. The combination comprising a speaker assembly integrally formed of ceramic material, the enclosure including a hemispheroidal shell portion and an integral flange portion, said shell portion being generally symmetrical with respect to a central axis and having an aperture at its apex, a threaded nipple element extending through said aperture, a decorative loop on the exterior of said shell portion and connected to said nipple element, a nut within said shell portion threaded onto said nipple element and retaining said nipple element and said loop on said shell portion whereby said enclosure is adapted to be suspended by said loop, nipple element, and nut, said nipple element being adapted to allow an electrical wire set to be assembled through said aperture, said flange portion extending radially inward from said shell portion at a plane adjacent an equatorial plane of said hemispheroidal shell portion, a radially inward edge of said flange portion defining a generally circular speaker aperture concentric with said axis of symmetry, a side of said flange portion facing inwardly towards the interior of said shell portion providing a planar seating surface extending substantially along the full circumferential extent of said speaker aperture, a set of notches in said speaker aperture and interrupting said planar seating surface, a plurality of acoustic ports relatively small in comparison to the diameter of said speaker aperture circumferentially spaced about said flange portion, a speaker assembly within said hemispheroidal shell



portion, said speaker assembly having a peripheral rim and including a clamp ring having a diameter greater than the diameter of said aperture and being disposed over said seating surface, said flange notches being dimensioned to permit said speaker assembly to be inserted therethrough into the interior of said shell portion, a plurality of fasteners extending through said notches and said clamp ring and engaging an area of the speaker assembly adjacent the rim to draw said clamp ring and speaker assembly axially towards said seating surface to form an acoustic seal therebetween.

4,082,160

SILENCER FOR EXHAUSTING GAS STREAMS

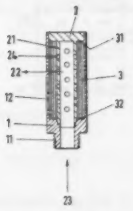
Hermann Schilling, Weinheim, and Heinz Seifert, Mannheim, both of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Apr. 8, 1976, Ser. No. 674,994

Claims priority, application Germany, Apr. 16, 1975, 2516626

Int. Cl.[2] F01N *1/08, 1/00, 3/06*

U.S. Cl. 181—258 **12 Claims**



1. A silencer for reducing the noise of an exhausting gas stream, comprising a body having a connecter portion and an air permeable portion, a sound-absorbing insert in the body and an air permeable inner component, the sound-absorbing insert comprising at least one split sheet of closed-pore foamed plastic material having a thickness of less than its average pore-size.

4,082,161

CONTINUOUS ADJUSTING SCAFFOLD

Curtis L. Johnson, Rte. 3, Box 42, Adamsville, Ala. 35005

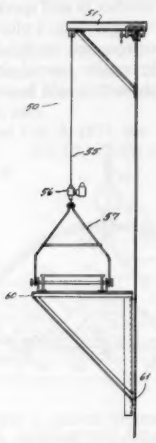
Filed Mar. 24, 1976, Ser. No. 669,965

Int. Cl.[2] E04G *3/10*

U.S. Cl. 182—82 **3 Claims**

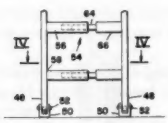
1. A continuous adjusting scaffold comprising in combina-

tion a plurality of scaffold sections pivotally attached together, each section including a scaffold of aluminum pick board in one piece and a steel plate connector, wherein, said connector including a channel between upper and bottom steel plates,



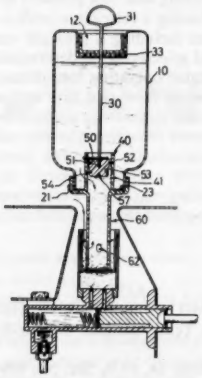
said channel at each end having means receiving a scaffold adjacently positioned thereto, wherein, a swing arm being pivotally connected to said connector and being located within one end of said channel, said swing arm being connectable to said scaffold at said one end.

4,082,162
A-FRAME LADDER EXTENDER
Richard C. Diez, Rte. 2, Box 751, San Jose, Calif. 95131
Filed Aug. 27, 1976, Ser. No. 718,132
Int. Cl.[2] E06C *1/22, 7/08*
U.S. Cl. 182—166 **7 Claims**



1. In combination:
an A-frame ladder which comprises a pair of main side rails having a plurality of parallel steps disposed therebetween, a pair of rear side rails pivotally secured with a top end thereof adjacent a top end of said main side rails, a platform secured atop said main and rear side rails and means for fastening said rear side rails at a fixed angle from said main side rails; and
an attachment extending the lengths of said main side rails equally so that said ladder can be stably positioned on stairs or the like, comprising:
a pair of parallel equal length extender rails;
means for attaching each extender rail, each adjacent a top end thereof, each adjacent a bottom end of a respective one of said main side rail to extend longitudinally therefrom; and
telescoping means below the bottom ends of said main side rails parallel to said steps and extending telescopically from a respective one to a respective other of said extender rail intermediate said bottom end of each of said main side rails and a bottom end of each respective one of said extender rails, said telescoping step means comprising a first rod integrally attached at a first end thereof to a first of said extender rails, said first rod having a cavity extending longitudinally thereinto from a second end thereof and a second rod integrally attached to a first end thereof to a second of said extender rails at an equal distance from the top end of said second of said extender rails as said first end of said first rod is attached from the top end of said extender rails, a second end of said second rod being sized to matingly slidably fit within said cavity, said first and second rod and said cavity being rectangular in cross-section to provide a flat stepping surface and a non-turning fit of said second end of said second rod within said cavity.

4,082,163
OIL REPLENISHING CARTRIDGE
Norikazu Takeishi, 453, Nanjo, Nirayama-cho, Tagata-gun, Shizuoka-ken, Japan
Filed Dec. 22, 1976, Ser. No. 753,174
Int. Cl.[2] F01M *11/06*
U.S. Cl. 184—105 R **4 Claims**

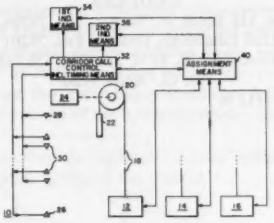


1. An oil replenishing cartridge comprising a container for oil, a valve in the container controlling the flow of oil therefrom, the valve including a tube, a valve seat at the lower end of the tube and a valve body slidably mounted in the tube, a valve operating mechanism having a lower end connected to the valve body and an upper end extending exteriorly of the container for operating the valve from the outside of the container, and an oil feeding mechanism adapted to be mounted on a reserve tank of a hydraulic system of a motor vehicle, the oil feeding mechanism including a hollow member in communication at its upper end with the valve and provided with an oil outlet at its lower end and an air intake opening between the member ends, the oil feeding mechanism functioning to feed oil through the oil outlet to a level in the reserve tank as determined by the oil level in the reserve tank relative to the air inlet.

4,082,164
ELEVATOR SYSTEM

Milton Sackin, Pittsburgh, and George T. Hummert, Oakmont, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 24, 1974, Ser. No. 463,695
Int. Cl.[2] B66B 1/22
U.S. Cl. 187—29 R **23 Claims**



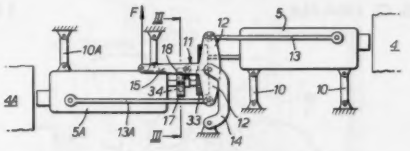
1. An elevator system for a structure having a plurality of floors, comprising:
a plurality of elevator cars,
means mounting said elevator cars for movement relative to the structure to serve the floors,
means for registering calls for elevator service for at least a predetermined direction from certain of said floors,
means canceling said calls for elevator service in response to predetermined conditions,
timing means recording the registration times of at least certain of the calls,
first indicating means identifying calls registered for a first predetermined period of time,
said timing means continuing to record the registration times of calls after they have been registered for the first predetermined period of time, at least until the calls have been registered for a second predetermined period of time,
second indicating means identifying calls registered for the second predetermined period of time,
and assignment means responsive to said calls for elevator service and to said first and second indicating means, said assignment means assigning elevator cars to serve at least certain of the calls according to a predetermined first strategy until said first indicating means indicates at least one of the calls has been registered for the first predetermined period of time, said assignment means assigning elevator cars to serve those calls registered for the first predetermined period of time according to a second predetermined strategy, at least until the second indicating means indicates at least one of the calls has been registered for the second predetermined period of time, said assignment means assigning elevator cars to serve those calls registered for the second predetermined period of time according to a third predetermined strategy, which differs from the second predetermined strategy.

4,082,165
BRAKE ASSEMBLY INCLUDING MOUNTING, ACTUATING AND ADJUSTING STRUCTURE

Anthony William Harrison, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Jun. 8, 1976, Ser. No. 693,799
Claims priority, application United Kingdom, Jun. 9, 1975, 24695/75
Int. Cl.[2] B61H 15/00
U.S. Cl. 188—59 **9 Claims**

1. A brake assembly comprising a plurality of brake parts, means for applying said parts in unison to respective, different rotors, said brake parts being arranged so that one only is applied to a respective rotor and each said brake part comprising a body of friction material, a separate adjustable length strut co-operating with each said body of friction material to transmit brake-actuating forces to said body of friction material and to adjust the position of said body of friction material relative to said rotor to compensate for wear, and a housing which carries both said body of friction material and said adjustable length strut therein, said housing, friction material and strut being movable in unison towards and away from the associated rotor surface to apply and release, respectively, said

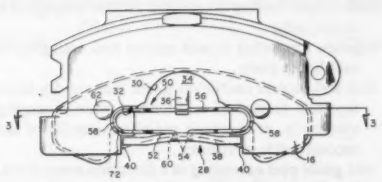


brake part; said body of friction material being supported by said housing close to its rotor surface whereby braking drag forces on said friction material are transmitted to said housing; and brake adjusting means separate from said applying means connected to each of said adjustable length struts to adjust the lengths thereof and including equalising means adapted to ensure that the lengths of all the adjustable struts are adjusted equally.

4,082,166
DISC BRAKE HAVING RETENTION DEVICE

Irving R. Ritsema, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Feb. 1, 1977, Ser. No. 764,607
Int. Cl.[2] F16D 55/224, 65/02
U.S. Cl. 188—73.6 **2 Claims**



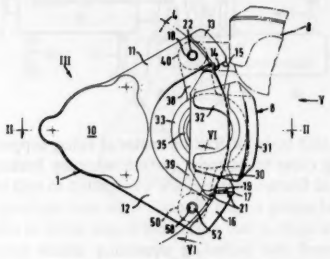
1. A disc brake comprising:
a rotor;
a caliper member extending over a portion of said rotor outer periphery;
a pair of friction elements carried by said caliper member at axially opposite sides of said rotor; and
resilient retention means releasably engaging said caliper member and one of said friction elements;
said one friction element including a backing plate having a tab and a flange and said resilient retention means engaging said tab, said flange and said caliper member to yieldably secure said one friction element to said caliper member;
said resilient retention means comprising a substantially elliptical spring, said substantially elliptical spring including end projections that extend into a slot on the flange, said spring also including a cross-piece arm that engages with the tab and a pair of arms between the end projections and the cross-piece arm that yieldably engage said caliper member to releasably connect said one friction element with said caliper member.

4,082,167

SLIDING CALIPER-TYPE DISC BRAKE AND SUPPORT STRUCTURE THEREFORE

Kenneth C. G. Einchcombe, Wickford, and Kazimierz F. Kornat, Chelmsford, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 685,023, May 10, 1976, abandoned.
This application Jun. 16, 1977, Ser. No. 806,977
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.6 **1 Claim**



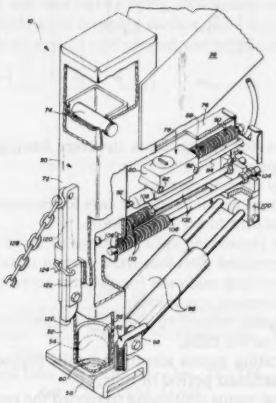
1. A floating caliper disc brake comprising an anchor plate, a caliper, a pair of brake pads, and a brake rotor;
said anchor plate having first and second diverging arms with first and second axially extending guide portions, respectively, at the outer ends of said arms;
said guide portions extending across the periphery of said rotor;
said pair of brake pads being supported by said guide portions and disposed adjacent the braking surfaces of said rotor;
each of said pair of brake pads having a first surface in slidable engagement with said first guide portion;
each of said pair of brake pads having a second surface circumferentially spaced from said first surface;
retainer spring means interposed between said second surfaces and said second guide portion;
said caliper having a reaction portion engaging one of said brake pads;
a piston supported in said caliper and engaging the other of said brake pads;
first and second cantilever guide pins rigidly secured to said first and second of said anchor plate diverging arms, respectively, at locations radially inwardly of said first and second guide portions;
said guide pins extending in a direction away from said rotor;
said caliper having first and second support arms extending in opposite circumferential directions;
said first and second support arms of said caliper having bores that slidably engage said first and second guide pins;
said guide pins being disposed within the radial dimension of said rotor;
said first guide pin being readily disengageable from said first diverging arm of said anchor plate and said caliper being constructed to be pivoted about said second guide pin when said first guide pin is disengaged from said first diverging arm, said caliper being pivotally displaceable to a position whereby said pair of brake pads may be readily removed from their engagement with said first and second guide portions for the purpose of repair or replacement;
limit means interposed between said second guide pin and said second support arm of said caliper constructed to limit the axial displacement of said caliper;
said limit means comprising a pair of axially spaced shoulders formed on said second guide pin and a reduced diameter portion formed on said second guide pin between said shoulders;
said limit means further comprising a threaded set screw extending through said second support arm of said caliper in a radial direction with respect to the axis of said second guide pin;
the inner end of said set screw being disposed between said shoulders of said second guide pin and spaced apart from said reduced diameter portion.

4,082,168

HYDRAULIC BRAKE SYSTEM FOR GOOSENECK TRAILERS

Victor L. Cole, 116 Tenth St., Sanger, Tex. 76266, and Kenneth D. Perry, 1210 Edinburgh, Denton, Tex. 76201

Filed Sep. 30, 1976, Ser. No. 728,113
Int. Cl.[2] B60T *7/20*
U.S. Cl. 188—112 R **3 Claims**



1. Apparatus for applying hydraulic trailer brakes comprising:
an upstanding post member;
means pivotally connecting the lower end of the upstanding post member to a towing vehicle;
a sleeve member telescopingly received over the post member, the upper end of said sleeve member being rigidly connected to a trailer towed by the towing vehicle;
pin means extending through the upper end of the post member and the upper end of the sleeve member for pivotally connecting the upper end of the post member to the upper end of the sleeve member;
an arm secured to the sleeve member at a point substantially above the point of pivotal connection of the post member to the towing vehicle and substantially below the point of pivotal connection of the sleeve member to the post member and extending rearwardly therefrom;
hydraulic master cylinder means for actuation to discharge hydraulic fluid;
at least one rod secured to the rearward end of the arm and extending through the arm and slidably received in the upstanding post member;
compression spring means mounted on the rod and biased against the upstanding post member for normally pivoting the arm and the sleeve member to a position relative to the upstanding post member wherein the hydraulic master cylinder means is deactuated;
shock absorber means connected between the lower end of the upstanding post member and the rearward end of the arm for damping relative pivotal movement therebetween;
said hydraulic master cylinder means comprising a housing defining a brake fluid reservoir, port means, and piston means for effecting brake fluid flow into and out of the housing through the port means;
means mounting the hydraulic master cylinder means within the arm with the housing thereof connected to the arm

and the piston engaging the upstanding post member for actuation to effect brake fluid flow in response to relative pivotal movement between the arm and the upstanding post member;

said hydraulic master cylinder mounting means further characterized by rod means slidably supporting the housing of the hydraulic master cylinder means on the arm and spring means biasing the housing of the hydraulic master cylinder means toward a position wherein the piston thereof engages the upstanding post member and accommodating relative sliding movement between the housing of the hydraulic master cylinder means and the arm in response to further relative pivotal movement between the arm and the upstanding post member following actuation of the piston of the hydraulic master cylinder means; and

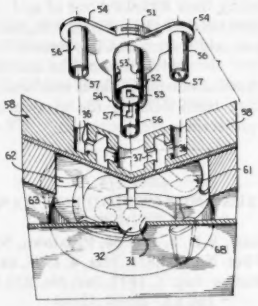
means connecting the hydraulic master cylinder means to the hydraulic brakes of the trailer.

4,082,169

ACCELERATION CONTROLLED FLUIDIC SHOCK ABSORBER

Romald E. Bowles, 2105 Sondra Ct., Silver Spring, Md. 20904

Filed Dec. 12, 1975, Ser. No. 640,186
Int. Cl.[2] F16F *9/34, 9/50*
U.S. Cl. 188—322 **6 Claims**



1. A compression valve for a shock absorber having a compression chamber said compression valve comprising a vortex chamber for controlling flow out of the compression chamber into a reservoir of the shock absorber partly filled with a compressible fluid, said vortex valve having a substantially radial fluid input and a substantially tangential fluid input, means for supplying fluid to said inputs, an accelerometer and means responsive to said accelerometer for decreasing fluid input to said tangential fluid input as a function of increasing acceleration,

said accelerometer and said last mentioned means comprising a mass, spring means for biasing said mass to a first position, first and second ports communicating with said radial and said tangential fluid inputs, respectively, said first and second ports being closed and open respectively, to fluid flow by said mass when in said first position and being increasingly opened and closed by said mass as a function of increases in acceleration,

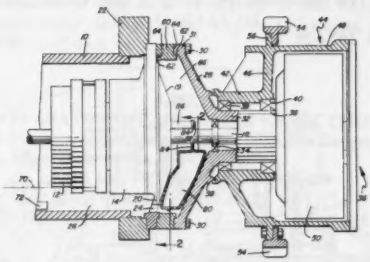
said mass comprising a central hollow tube; a body having a central cylindrical aperture for receiving said hollow tube, said body having means for communicating with said first input, said first port being an opening through said hollow tube.

4,082,170

FINAL DRIVE BLADDER

Arthur J. Ritter, Metamora, and James R. Deck, Eureka, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 14, 1977, Ser. No. 768,120
Int. Cl.[2] B60K *41/24;* **B62D** *55/12;* **F16D** *67/02*
U.S. Cl. 192—13 R **9 Claims**



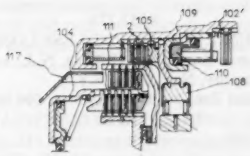
1. A final drive assembly having a housing with a cavity therein, a perforated flange supporting a cover across one end of said cavity, an end cap and a spacer bolted to the end of said housing to define a relatively large volumn open space between said end cap and said cover, said open space communicating into the cavity through the perforated flange, and means positioned in said open space to occupy a substantial portion of said open space so as to prevent excessive amounts of fluid from collecting in said open space.

4,082,171

ROTARY PLATE CARRIER DRUM FOR MULTI-PLATE CLUTCHES OR BRAKES

André Lalin, and Roger Brisabois, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 21, 1976, Ser. No. 725,232
Claims priority, application France, Sep. 25, 1975, 75 29352
Int. Cl.[2] F16D *13/52*
U.S. Cl. 192—70.2 **2 Claims**

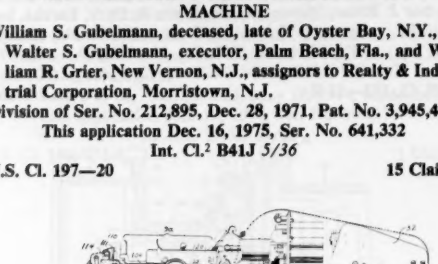


1. Rotary plate-carrier drum, notably for multi-plate clutches and brakes, which comprises at least two longitudinal slots extending on either side of a key engaging an elongated hole formed in an axial abutment member for the friction plates associated with said drum, the outer end of said key being shaped to act as a stop to said abutment member, said abutment member constituting the friction-plate bearing plate of a pair of clutches and extending both inwards and outwards of the outer peripheral cylindrical portion of said drum.

4,082,172
JUSTIFYING TEXT WRITING REPRODUCING MACHINE

William S. Gubelmann, deceased, late of Oyster Bay, N.Y., by Walter S. Gubelmann, executor, Palm Beach, Fla., and William R. Grier, New Vernon, N.J., assignors to Realty & Industrial Corporation, Morristown, N.J.

Division of Ser. No. 212,895, Dec. 28, 1971, Pat. No. 3,945,480. This application Dec. 16, 1975, Ser. No. 641,332
Int. Cl.[2] B41J *5/36*
U.S. Cl. 197—20 **15 Claims**



1. A text reproducing apparatus for printing successive lines of text corresponding to information encoded on a storage means,

said encoded information comprising a coded conditioning signal at a position on said storage means corresponding to the beginning of each of said lines, and a plurality of coded text reproducing signals corresponding to characters, words and character appearance information for each line to which one of said conditioning signals corresponds,

said conditioning signal comprising a single code defining a combination of initial character appearance parameters including (i) case condition, (ii) boldness of print, and (iii) print-no print conditon;

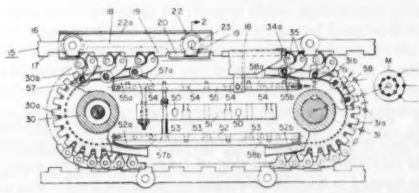
conditioning means responsive to said conditioning signal for establishing corresponding values of said parameters for text to be reproduced in each corresponding line; and

text reproducing means responsive to said conditioning means and the text reproducing signals of a corresponding line to print a corresponding line of text the characters of which have an appearance initially defined by said established parameter values, and conforming to the character appearance information contained in said text reproducing signals.

4,082,173
DRIVE UNIT FOR AN ENDLESS CONVEYOR

Arnulf Ivan Simon-Kochloffel, Hillside, N.J., assignor to Otis Elevator Company, New York, N.Y.

Filed Jun. 10, 1976, Ser. No. 694,865
Int. Cl.[2] B61B *13/14*
U.S. Cl. 198—330 **15 Claims**



1. For use with an endless conveyor supported on a structural member and having an endless member with a load bearing side and a non-load bearing side opposite thereof extending over a predetermined path, said non-load bearing side having teeth defining grooves between adjacent teeth, a drive unit including:

a pair of sprockets mounted on said structural member between the ends thereof, said sprockets being displaced from each other along said path;

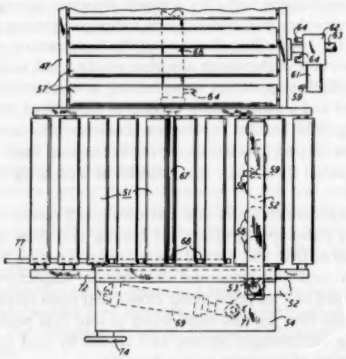
a motor supported on said structural member rotatably driving one of said sprockets; an endless driving chain arrangement including a driving chain comprising chain links joined together by link pins, and having first bearing elements engaging each of said sprockets whereby said chain is driven on a circular path around each sprocket and on linear paths between both sprockets by said motor driven sprocket, said endless chain having second bearing elements extending outwardly from said driving chain each comprising a drive cam pivotally mounted on each alternate driving chain link pin adjacent said chain links and having a first tooth-like projection with a first bearing surface, and an idler cam cooperating with each driven cam pivotally mounted on each driving chain link pin adjacent a driving chain link pin on which a drive cam is mounted and having a second tooth-like projection with a second bearing surface, said first and second tooth-like projections of each second bearing element extending outwardly from said driving chain;

said first and second bearing surfaces of said second bearing elements disposed in an opposed relationship forming opposed bearing surfaces having a variable separation distance therebetween, each said separation distance having a first magnitude when said second bearing elements are driven around said circular paths, said first and second tooth-like projections of each second bearing element being inserted into a respective groove in said endless member during their travel on one of said circular paths; and said separation distance being increased to a second magnitude as said second bearing elements are advanced from said one circular path to one of said linear paths to urge said opposed bearing surfaces into bearing against the two opposing teeth defining the groove in which said tooth-like projections are positioned.

4,082,174
APPARATUS AND METHOD FOR HANDLING BUNDLES OF SHEETS

Walter John Stobb, R.D. 1, Box 60, Pittstown, N.J. 08867

Continuation of Ser. No. 663,826, Mar. 4, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,421
Int. Cl.[2] B65G *37/00*
U.S. Cl. 198—368 **2 Claims**



1. Apparatus for handling a row of bundles of sheets, comprising a first conveyor for movably supporting said bundles of sheets in an upstanding position, a second conveyor disposed adjacent said first conveyor and forming a juncture therewith and being in bundle-movement communication therewith and

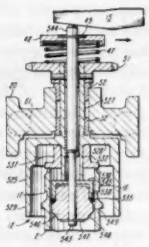
extending in a direction angulated to the direction of bundle movement for said first conveyor, said first conveyor having movable anti-friction support members for movably supporting said bundles of sheets on said first conveyor in a row relationship, a gate disposed at said juncture and being movably disposed into and out of the path of movement of said row of said bundles of sheets on said first conveyor for metering of the movement of the first one of said bundles of sheets in said row and relative to and toward said second conveyor, a brake operatively associated with said anti-friction members of said first conveyor and being spaced upstream from said gate and at a location relative to the second one of said bundles in said row for engaging said anti-friction members and retarding the movement of said anti-friction members and thereby holding all but the first one of said bundles of sheets relative to said first conveyor and against movement along said first conveyor, control mechanism operatively inter-connected with both said brake and said gate for operating said brake and said gate in synchronization whereby movement of said gate actuates said brake to interrupt movement of all but the first one of said bundles in said row of bundles, a guide mechanism connected with said control mechanism and including a powered device movable across said first conveyor in synchronization with the operation of said gate, and said powered device being disposed adjacent said first bundle and in line with said juncture to be engagable with said first of said bundles and diverting it off said first conveyor and onto said second conveyor, further said powered device includes a plurality of upstanding members, each upstanding member extending between said anti-friction members and above said first conveyor.

4,082,175

CONVEYOR COMBINED WITH COUPLING

Joseph Franz Gibbemeyer, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 17, 1977, Ser. No. 796,846
Int. Cl.[2] B65G *47/90*
U.S. Cl. 198—377 **10 Claims**



1. An improved coupling assembly for use in combination with a conveyor means to form a machine that carries an elongated hollow workpiece between workstations which machine further includes conveyor means movably mounted relative to the base of said machine for supporting at least one such coupling for repeated movement therebetween and unloading and wherein said improved coupling comprises -

(a) a carrier that is a part of said conveyor means;

(b) a support member having an upper stem portion and a lower portion, said upper portion being mounted on said carrier to revolve but not reciprocate relative to said carrier, said lower portion having internal shoulder means surrounded by a cup-shaped member, the cup being defined by an annular wall surrounding a chamber and an end wall supporting at least a portion of said internal shoulder means and connecting said stem portion to said annular wall and having an open end on the bottom of said cup opposite said end wall;

(c) a follower slidably supported in said stem portion and having the lower end of said follower substantially within said chamber, said follower being movable axially toward and away from said open end; and

(d) detent means comprising a resilient metallic annular member supported about said follower and between said follower lower end and said end wall and radially movable, respectively, in and out from the central portion of said chamber responsive to expansion and contraction respectively, from axial movement of said follower to respectively disengage and engage an internal annular portion of such workpiece

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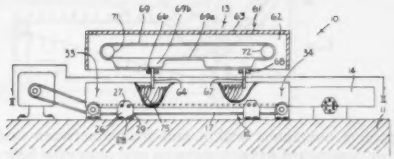
4,082,176

APPARATUS FOR HANDLING SNACK CHIPS

Dennis Pommer, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Jan. 19, 1976, Ser. No. 650,408
Int. Cl.[2] B65G *47/29*
U.S. Cl. 198—411 **8 Claims**



1. Apparatus for handling a column of uniformly shaped, nested, individual curvilinear snack chips, said apparatus comprising:

conveyor means including a pair of substantially parallel side wall means, a pair of parallel, spaced elongated conveying surfaces disposed between and in alignment with said pair of wall means, and elongated stationary support means disposed between said pair of belt means; and

shifting means for acting on said column of individual chips to shift the support of said column from said conveyor belt means to said stationary support means and from said stationary support means to said conveyor belt means, said shifting means comprising gate means and reciprocable driving means for moving said gate means into and out of the conveying path traversed by said column of chips,

whereby said gate means is moved into said path to change the orientation of said individual chips from a position approaching but greater than horizontal to a position approaching but less than vertical thereby shifting the support of said column from said pair of belt means to said stationary support means and whereby said gate means is moved out of said path to permit the individual chips to return to a position approaching horizontal.

4,082,177

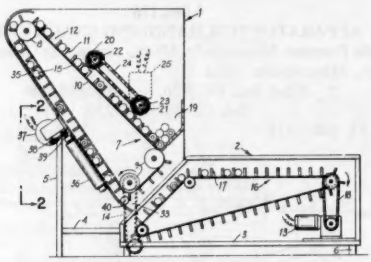
CONTAINER CONVEYING APPARATUS

Samuel S. Aidlin, 214 Beaumont St., Brooklyn, N.Y. 11235, and Stephen H. Aidlin, 934 Glenwood Rd., West Hempstead, N.Y. 11581

Filed Oct. 21, 1976, Ser. No. 734,650
Int. Cl.[2] B65G *47/12*
U.S. Cl. 198—453 **22 Claims**

1. An apparatus for conveying and positioning plastic containers as received in a random fashion, to a point for subsequent placement on to an associated container orientation apparatus, including: a frame; container conveying means mounted on said frame extending upwardly and being provided with a rotatable endless conveyor belt adapted to initially travel upwardly in a forward direction and then proceed downwardly toward a point of origin; receptacle means disposed in proximity to said conveyor belt at said point of origin, for receiving containers to be advanced on said conveyor belt; said conveyor belt being formed by web means along its entire length, having a plurality of traversely spaced cleats mounted

thereon, defining spaces for receiving said containers for travel along said conveyor belt; abutment means disposed in close proximity to the side edges of said cleats and extending in a longitudinal direction on one side of said conveyor belt; first rotatable guide means mounted on said frame, disposed above the line of travel of said belt to clear said advancing cleats, said guide means being adapted to direct individual containers within the respective cleat spaces and control movement of said containers during forward advancement on said conveyor belt; positioning means mounted to said frame in spaced relation to said conveyor belt, for maintaining the position of said



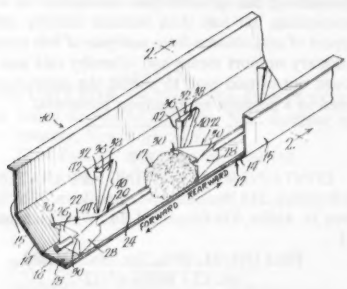
respective containers within said spaces between said cleats during downward advancement on said conveyor belt; second rotatable guide means transversely mounted with respect to the line of travel to said conveyor belt for urging said containers to move in a lateral direction within each of said cleats until container engagement with said abutment means; and container discharge means formed at the lower portion of said frame at a point proximate to said conveyor belt point of origin, for discharging each of said advancing containers positioned against said abutment means being conveyed by said conveyor belt.

4,082,178

HARPOON-TYPE CONVEYOR

Melvin Van Nocker, Kalamazoo, Mich., assignor to Prab Conveyors, Inc., Kalamazoo, Mich.

Filed Aug. 23, 1976, Ser. No. 716,428
Int. Cl.² B65G *25/08, 47/00*
U.S. Cl. 198—741 **14 Claims**



1. In a harpoon-type conveyor for transporting swarf-like material which includes a conveyor trough having an upstream end and a downstream end and defined by upstanding trough wall means, and a reciprocating harpoon means in said trough adapted to reciprocate between a rearward position and a forward position while urging the swarf-like material along said trough, the improvement comprising:

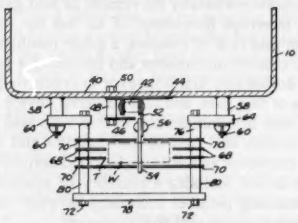
at least a pair of opposed barbs mounted inside said trough and having a rearwardly slanted retaining surface adapted for engaging and retaining a portion of said material in place as said harpoon means is moved from said forward position to said rearward position during a return stroke, and an inwardly slanting feed surface adapted for slidably passing said material thereover during a forward stroke; said slanted retaining surface extending upwardly away from the bottom of said trough in the upstream direction whereby a potentially interfering piece of material in said trough rides up said slanted retaining surface without substantial interference with said return stroke.

4,082,179

WORKPIECE ELEVATOR

Ralph E. Beyer, Fraser, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed Mar. 22, 1976, Ser. No. 668,825
Int. Cl.² B65G *15/60*
U.S. Cl. 198—801 **15 Claims**



1. In a workpiece elevator of the type including an upright housing, sprockets journalled in said housing adjacent the upper and lower ends thereof, an endless conveyor chain trained around said sprockets, the chain having a vertical run disposed along one wall of the housing and a plurality of workpiece supports secured to the chain such that on said vertical run of the chain the supports extend horizontally in a direction outwardly away from said wall of the housing, that improvement which comprises a guide rail assembly removably mounted as an integral unit on said wall of the housing, said guide rail assembly comprising a pair of laterally spaced, vertically extending support bars, a plurality of vertically spaced fastening members securing said support bars on said housing in fixed laterally spaced relation on opposite sides of the support members on said vertical run of the chain, a plurality of vertically extending guide rails mounted directly on each of said support bars by means independent of said fastening members, said guide rails forming a vertically extending trackway for guiding workpieces carried by said work supports and rigid tie bar means independent of said housing and said fastening members connecting said support bars in said fixed laterally spaced relation, said support bars forming the sole means for supporting said guide rail assembly on said housing and said fastening members forming the sole means securing the guide rail assembly to said housing, whereby, upon release of said fastening members, the assembly of said support bars, guide rails and tie bar means can be removed from said housing as an integral assembly.

4,082,180

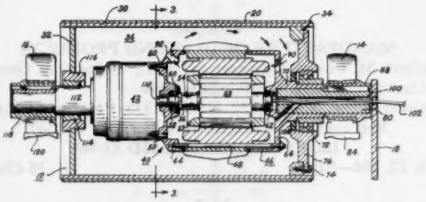
MOTORIZED CONVEYOR PULLEY

Jackson Chung, Mishawaka, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Aug. 2, 1976, Ser. No. 710,683
Int. Cl.² B65G *23/00*
U.S. Cl. 198—835 **9 Claims**

1. A motorized conveyor pulley comprising a rim and two end discs defining a closed compartment, said end discs being secured to said rim and having axially aligned openings therethrough, an electric motor and a speed reducer disposed in said compartment, an adapter connecting said motor and reducer and having air flow openings near the periphery thereof, said

motor having an end wall disposed at the end opposite said adapter and having air flow openings therein, a nonrotatable shaft connected to said motor housing and extending outwardly through the opening in one of said end discs in axial alignment with said rim, a means connected to said shaft for preventing rotation thereof, a bearing disposed on said shaft and connected to said one end disc, means for continuously



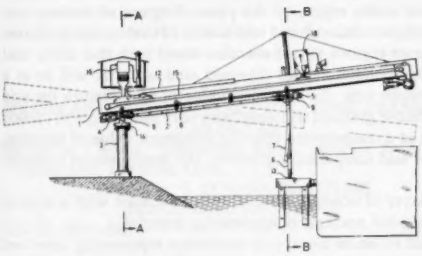
recirculating cooling air through said air flow openings between said motor and said compartment, said speed reducer having an input shaft means connected to said motor in said compartment and an output shaft means disposed in axial alignment with said first mentioned shaft and said rim and extending outwardly through the opening in the other of said end discs, and means rigidly connecting said output shaft means to said other end disc.

4,082,181

SHIP-LOADING INSTALLATION

Heinz Berthold, Willi-Gray-Str. 23, D 6672 Rohrbach/Saar, and Karl Gehring, Schrappacher Str. 8, D 6672 St. Ingbert/Saar, both of Germany

Filed Apr. 13, 1976, Ser. No. 676,651
Claims priority, application Germany, Apr. 17, 1975, 2516943
Int. Cl.[2] B65G *21/00*
U.S. Cl. 198—863 **4 Claims**



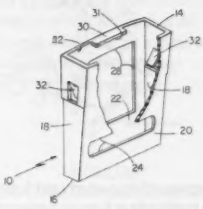
3. A ship-loading installation, which comprises
a circular track,
a column disposed at the center of said track and carrying a first rocker, which is provided with first roller means,
an outer support movable on wheels along said track and carrying a second rocker, which is provided with second roller means,
a bridge mounted for pivotal movement in a vertical plane, said bridge extending between said column and said outer support and having a length that exceeds the distance between said rockers, said bridge comprising an enclosure that extends virtually throughout the length of said bridge and defines therein a peripherally enclosed cavity, said enclosure comprising a top wall formed with a longitudinal slot which extends from a point near said column away from the latter,
a closure for selectively closing said slot,
an endless belt conveyor arranged in said cavity and adapted to be charged through said slot with material to be loaded, and
shifting means defined by driven pin teeth connected to said bridge and driving pin teeth carried by said central column and in mesh with said driven pin teeth being operable to shift said bridge in its longitudinal direction in cooperation with said rollers.

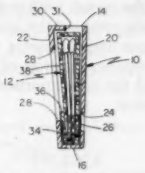
4,082,182

MATCHBOOK COVERS

Richard P. Barrette, Lancaster, Mass., assignor to Automated Molding Corporation, Westboro, Mass.

Filed Dec. 20, 1976, Ser. No. 752,401
Int. Cl.[2] A24F *27/00*
U.S. Cl. 206—107 **9 Claims**





1. In a matchbook cover comprising continuous front, back and side walls defining a generally wedge-shaped interior cavity closed at its bottom and generally open at its top and of size and shape to receive a matchbook therewithin, that improvement wherein:
a holding tab projects from the top of said back wall partially over the top of said cavity towards said front wall in position to partially overlie the top of a matchbook in said cavity and retain and prevent withdrawal of said matchbook from said cavity until said back and front walls are flexed outwardly in response to force applied to said side walls to increase the distance between said front wall and the adjacent edge of said tab to permit such withdrawal;
a striker opening is provided in said front wall adjacent the bottom thereof in position to overlie the striking surface of a matchbook positioned wholly within said cavity;
a finger opening is provided in the central portion of said back wall; and,
cover portions project inwardly from each of said side walls in position for engaging bottom portions of matchbook positioned partially within said cavity to prevent the matchbook from being removed from the cavity without at least partially destroying the cover portions of the matchbook bottom portions.

4,082,183

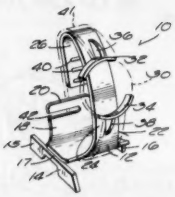
DEVICE FOR DISPLAYING WRIST WATCHES

Michael Sturm, Brookfield, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed Aug. 9, 1976, Ser. No. 712,495
Int. Cl.[2] B65D *85/40, 5/50*
U.S. Cl. 206—301 **10 Claims**

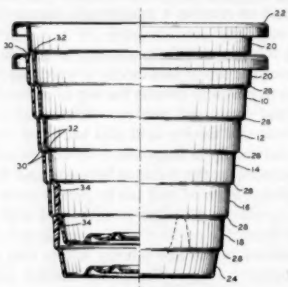
1. A display device for wrist watches including a display stand capable of free standing on a support surface, said display stand comprising

a base having front and rear portions;
leg means depending from said base for supporting said display stand on the support surface with said base spaced above the support surface;
an arcuate lower member extending upwardly and integrally from the rear portion of said base and terminating in an upper edge;
a flexible, generally inverted J-shaped cuff member including a front portion extending upwardly and integrally from the front portion of said base and a rear portion



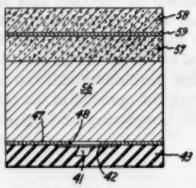
extending downwardly toward said lower member upper edge and terminating in a free end spaced from said lower member upper edge; and
means on the front portion of said cuff member for embracing the back of the watch with one portion of the watch wristband extending around the lower portion of said cuff member, said base and at least a portion of said lower member and the other portion of the watch wristband extending around the upper portion and said rear portion of said cuff member.

4,082,184
NONLOCKING NESTABLE CONTAINER
Gregory Wilton Hammer, R.R. No. 1, Hamler, Ohio 43524
Filed Jan. 24, 1977, Ser. No. 761,863
Int. Cl.[2] B65D *21/02*
U.S. Cl. 206—519 5 Claims



1. A molded nonlocking nestable vegetable hamper and the like capable of being removed from a one piece internal mold section, and comprising: a generally cup-shaped container having an open top and a closed bottom and sidewalls of a uniform thickness stiff enough to support other similar hampers loaded with vegetables when stacked on its upper edge, said sidewalls being stepped inwardly from top to bottom to provide a plurality of concentric segments separated by identically shaped shoulders having rounded edges, said sidewalls of each segment being tapered inwardly at an angle which causes the bottom outside rounded edge of one segment to nest into a container opposite the top inside rounded edge of the same segment of another one of the hampers, and circumferentially spaced apart stops for engaging one or more of said shoulders and formed by a thickened section of segment sidewall extending between the top and bottom of a segment with its exposed surface being vertical and the side edges of the stops being tapered to release vertically from a one piece internal male mold section, said stops holding said outside and inside rounded edges of said shoulders of nested hampers opposite each other, so that flexing of one hamper over another separates nested hampers.

4,082,185
MANUFACTURE OF DIAMOND PRODUCTS
Herbert M. Strong, Schenectady, N.Y., assignor to General Electric Company, Worthington, Ohio
Division of Ser. No. 412,332, Nov. 2, 1973, Pat. No. 4,042,673.
This application Jul. 15, 1976, Ser. No. 705,547
Int. Cl.[2] C01B *31/06;* B65D *85/00*
U.S. Cl. 206—525 19 Claims

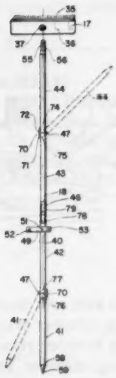


1. In a reaction vessel for introduction into the reaction volume of a high pressure, high temperature apparatus, said reaction vessel constituting an assembly of interfitting elements for enclosing diamond seed material and a source of substantially pure carbon separated by a mass of metallic catalyst-solvent for the diamond-making reaction disposed therebetween so as to provide a predetermined temperature gradient between said diamond seed material and said source of carbon under operating conditions of pressure and temperature in the diamond stable region of the phase diagram of carbon, said diamond seed material and said source of carbon being located in separate regions of said reaction vessel such that under said operating conditions said diamond seed material will be at a temperature near the minimum value of temperature for said temperature gradient and simultaneously said source of carbon will be at a temperature near the maximum value of temperature for said temperature gradient, the improvement comprising,
a. a layer of isolating material in combination with a layer of diamond nucleation suppressing material,
b. said isolation layer, said nucleation suppressing layer and said mass of metallic catalyst-solvent being of different materials in any given reaction vessel construction and said isolation layer being made of a material having a melting point, when in contact with diamond, that is higher than the melting point of the metallic catalyst-solvent saturated with carbon dissolved therein when in contact with diamond,
c. said isolation layer being in contact with the diamond seed material and being disposed between the said diamond seed material and the mass of metallic catalyst-solvent,
d. said nucleation suppressing layer being disposed in contact with the underside of the mass of catalyst-solvent material,
e. the metallic catalyst-solvent being disposed in separate first and second layers and
f. the source of carbon being disposed in separate third and fourth layers with said third layer located between said first and second layers and said second layer between said third and fourth layers,
g. said first layer at least containing an impurity for coloring diamond growth.

4,082,186
PORTABLE CLEANING TOOLS

Frank Chirumbolo, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 31, 1977, Ser. No. 764,133
Int. Cl.[2] F41C *19/00*
U.S. Cl. 206—577 4 Claims

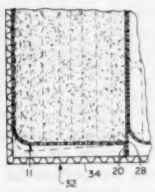


1. A portable kit of cleaning tools, comprising
a bag,
a collapsable pail of telescopic construction,
a wiper blade unit,
a broom unit, and
a foldable pole,
said bag of a size to enclose said wiper blade, broom unit, said pail in the collapsed condition, and said pole in the folded condition,
said pole shaped at one end with threaded means to engage a threaded hole in the broom unit, and shaped with a tapered section at the opposed end of the pole of a size to fit a tapered socket hole in the handle of the wiper blade.

4,082,187
MEANS AND METHOD FOR PACKAGING FRANGIBLE ARTICLES

Bayard L. Carlson, Wilsonville, Oreg., assignor to AMFAC Foods, Inc., Portland, Oreg.

Filed Nov. 5, 1976, Ser. No. 739,085
Int. Cl.[2] B65D *85/36, 81/08*
U.S. Cl. 206—585 18 Claims

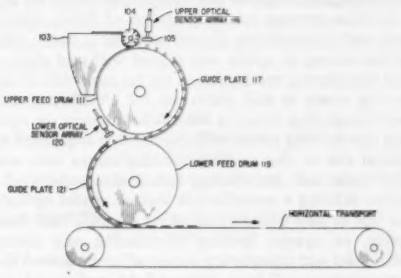


1. A packaging system for shipping frangible articles comprising:
a rigid-walled shipping container having a plurality of sidewalls and opposed top and bottom walls,
at least one package within said container, said package having a body portion containing one or more frangible articles,
said package including a shock-absorbing means for cushioning said articles during shipment to inhibit their breakage, said shock-absorbing means comprising:
flange means extending outwardly from and generally transversely of an adjacent said body portion of said package;
said body portion selected from a material and thickness of material providing a controlled flexing thereof relative to said flange means while having a self-supporting capability,
said package being arranged and supported generally on its side during shipment with its flange means engaging said bottom wall and supporting said body portion in cantilevered relationship above said bottom wall,
the cantilevered length of said body portion from its supporting flange means, and the width of said flange means being selected in relation to the total weight to be imposed on and carried by the body portion during shipment so as to provide a controlled deflection of said body portion relative to its supporting flange means toward said bottom wall without contacting said bottom wall when said container is jolted during shipment.

4,082,188
APPARATUS FOR COLOR RECOGNITION AND DEFECT DETECTION OF OBJECTS SUCH AS CAPSULES

William Charles Grimmell, Lake Hiawatha; Gilbert Carl Kaetzel, Wayne, both of N.J.; John Milton Moran, Nazareth, Pa., and George Michael Zanko, Montville, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 23, 1976, Ser. No. 698,987
Int. Cl.[2] B07C *5/342*
U.S. Cl. 209—73 28 Claims



1. Apparatus for the automated surface analysis of objects of a particular elongated geometric form and for classifying said objects into acceptable and non-acceptable categories, comprising:
(a) first means arranged to receive electromagnetic radiation from the objects and for generating electrical signals corresponding thereto;
(b) second means for effecting relative translational movement between said first means and the objects and for providing output signals which are utilized in determining the instantaneous relative location of the objects, said second means including means for orienting the objects in a first non-degenerate orientation for at least one end-on viewing by said first means and a second non-degenerate orientation for a different viewing by said first means; and
(c) third means connected to said first and second means for sampling the signals generated by said first means based at least in part on object location and processing said sampled signals into a form representative of object shape, said third means including means for storing a reference representative of the intended object shape and means for comparing the processed sampled signals with the stored reference and for generating output signals representative of the acceptability or non-acceptability of each object.

4,082,189

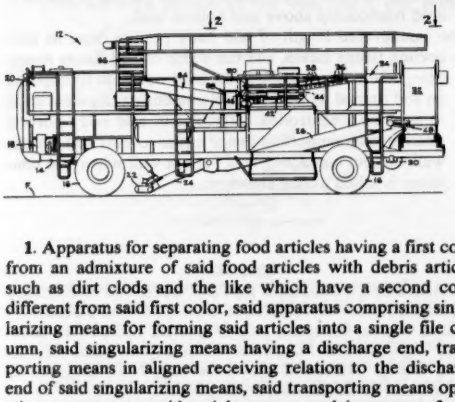
APPARATUS FOR SEPARATING FOOD ARTICLES FROM FIELD DEBRIS

Henry P. Cordes, Vacaville, Calif., assignor to Basic Vegetable Products, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 524,086, Sep. 15, 1974, abandoned. This application Jun. 28, 1976, Ser. No. 700,326

Int. Cl.[2] B07C *5/342*

U.S. Cl. 209—73 **13 Claims**



1. Apparatus for separating food articles having a first color from an admixture of said food articles with debris articles such as dirt clods and the like which have a second color different from said first color, said apparatus comprising singularizing means for forming said articles into a single file column, said singularizing means having a discharge end, transporting means in aligned receiving relation to the discharge end of said singularizing means, said transporting means operating to transport said articles at a speed in excess of said singularizing means so that said articles on said transporting means are in spaced apart relation thereon, photoelectric means disposed adjacent said transporting means for producing a signal in response to transportation of debris articles therepast, said photoelectric means including a photo cell, a lens system having an optical axis aligned with said photo cell and said transporting means, means on the same side of said transporting means as said photo cell for illuminating articles on said transporting means as the articles intersect the optical axis, said transporting means defining a slot in alignment with said optical axis so that said transporting means does not reflect light from said illuminating means along said optical axis, means defining a nonreflective surface in said optical axis on the side of said transporting means opposite said illuminating means, an opaque housing surrounding said photoelectric means and said transporting means adjacent thereto for shielding said photo cell from ambient light so that said photo cell responds only to light from said illuminating means reflected from articles on said transporting means, and means responsive to said signal for ejecting said debris articles on said transporting means upward from said transporting means.

4,082,190

DESK ORGANIZER

Eric Robert Merz, 12 Shoestring La., Brookhaven, N.Y. 11719

Filed Aug. 13, 1975, Ser. No. 604,427

Int. Cl.[2] B42F *1/00*; A47F *7/00*

U.S. Cl. 211—11 **8 Claims**

1. A desk-organizer for temporary storage and retrieval of letter correspondence and like matter comprising sheet material, said desk-organizer comprising:

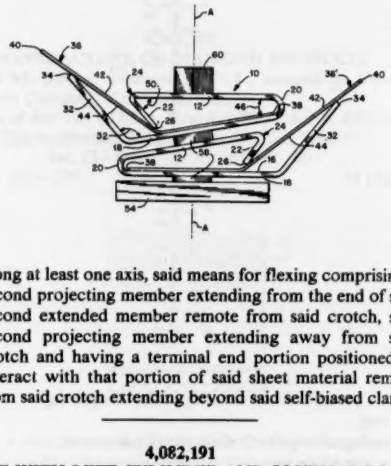
a first paper-holder mounted on base means for stable support on an extended surface, said paper-holder comprising;

(a) unitary resilient means defining a bifurcate structure having at least a first extended member facing a second extended member and joined therewith at a crotch, said bifurcate structure comprising a plurality of planar rectilinear elements,

(b) means forming an oriented-access for the insertion of said sheet material, said oriented-access comprising a first projecting member extending from the end of said first extended member remote from said crotch, said first projecting member extending towards said crotch and said second extended member,

(c) means forming a self-biased clamp for urgedly engaging sheet material inserted through said oriented-access,

and, (d) means for flexing said sheet material into a non-planar configuration having improved structural stability



along at least one axis, said means for flexing comprising a second projecting member extending from the end of said second extended member remote from said crotch, said second projecting member extending away from said crotch and having a terminal end portion positioned to interact with that portion of said sheet material remote from said crotch extending beyond said self-biased clamp.

4,082,191

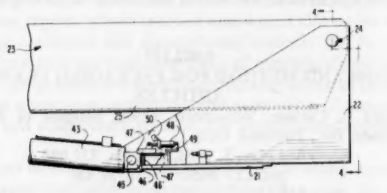
CRANE WITH LEFT CYLINDER AND JOURNAL LOCK AND RELEASE DEVICE

Reginald P. Whittingham, St. Thomas, Pa., assignor to Walter Kidde & Company, Inc., Shady Grove, Pa.

Division of Ser. No. 548,149, Feb. 7, 1975, Pat. No. 3,954,193. This application Oct. 24, 1975, Ser. No. 625,387

Int. Cl.[2] B66C *23/06*

U.S. Cl. 212—59 R **5 Claims**



1. A crane boom, a turntable, said crane boom being pivotally connected to said turntable for movement in a vertical plane, a boom lift cylinder connected between said turntable and said boom for moving said boom in the vertical plane, one end of said boom lift cylinder being pivotally connected to the boom, pivot means operatively connecting the opposite end of said lift cylinder to said turntable, said pivot means comprising a pivot element, a journal box receiving and supporting said pivot element, socket means on said turntable, said socket means having an open top portion for fixedly and releasably receiving said journal box and associated pivot element, a locking plate movably mounted between two positions on said turntable, a power extensible and retractable device connected to said locking plate for shifting said locking plate between the two positions, said locking plate being shiftable in the plane of the open top portion of said socket means to a first position engaging the top of the journal box to fixedly mount said journal box in said socket means, thereby holding said pivot means in the operative position on said turntable during normal operation of said crane boom, said locking plate being shiftable to a second position clear of the open top portion and away from the top of the journal box to release the journal box from

said socket means, thereby disconnecting said pivot means from said turntable, whereby said journal box can be lifted from said socket means; and a positive locking element movably mounted on said power device, said positive locking element being movable into the path of movement of said shiftable locking plate to prevent retraction of said shiftable locking plate from said first position to thereby assure that the locking plate is held in the operative position during the normal operation of the crane.

4,082,192

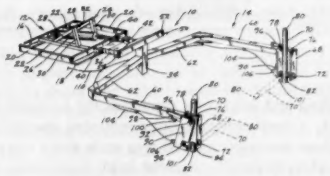
HAY BALE PICKUP AND TRANSPORT DEVICE

Randal A. Cox, R.R. 1, Van Wert, Iowa 50262

Continuation-in-part of Ser. No. 517,434, Oct. 23, 1974, Pat. No. 4,015,739. This application Jan. 26, 1976, Ser. No. 652,178

Int. Cl.[2] B66C *23/00*

U.S. Cl. 214—1 HA **8 Claims**



1. A hay bale pickup and transport device comprising,

a base assembly adapted to be mounted on a vehicle and including a power means connected to a hay bale arm for moving said arm between a horizontal lowered position and a raised position,

said hay bale arm including spaced apart parallel arm portions,

hay engaging fingers on the free ends of each of said arm portions adapted to pivot between a first position with said fingers being parallel to each other and the plane of said arm portions and extending in opposite directions and a second position with said fingers extending in directions approximately 90° to said fingers in said first position, and

stop means for selectively holding said fingers in said first position, said stop means including a first stop for limiting said fingers from pivoting downwardly from said first position and a second stop for limiting said fingers from pivoting upwardly, said second stop being moveable between locked and unlocked positions and said fingers being freely pivotable upwardly from said first position when said second stop is in said unlocked position in response to said fingers engaging a hay bale on the ground as said hay bale arm is moved to its lowered position over a hay bale.

4,082,193

PIPE HANDLING APPARATUS

J. T. Teague, Longview, Tex., assignor to LeRoy LaSalle, Carthage, Tex.

Filed Jul. 23, 1970, Ser. No. 57,640

Int. Cl.[2] E21B *19/00*

U.S. Cl. 214—2.5 **9 Claims**

9. Apparatus for handling pipe wherein the pipe is transported between a pipe rack and another location comprising:

(a) a cable;

(b) means forming a pair of pipe receiving carriages;

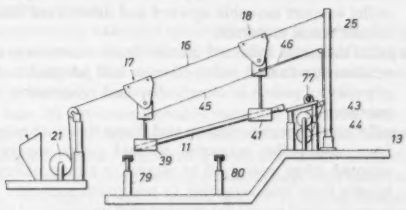
(c) means mounting said pipe receiving carriages for longitudinal movement along said cable so that they may support a pipe of specified length;

(d) moving means for moving at least one of said carriages along said cable;

(e) means anchoring one end of said cable;

(f) means controlling the tension in said cable to raise or lower said cable;

(g) said cable adapted to be positioned with part of it disposed in space in overlying relationship with respect to the pipe rack and part of it extending upwardly to be disposed in close proximity to the recited another location



so that said cable enables raising or lowering movement of said carriages;

(h) said moving means including a second cable;

(i) said second cable being attached to at least one of said carriages;

(j) means for moving said second cable to selectively position the carriage to which said cable is attached; and

(k) means forming at least one of said pipe receiving carriages for supporting a pipe, and further including means for temporarily supporting a pipe on said pipe receiving carriages during raising or lowering movement of the pipe along said cable.

4,082,194

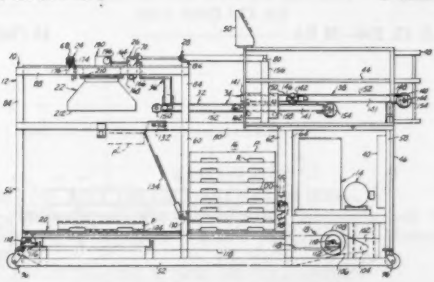
SELF-CONTAINED PALLET-ELEVATING BAG PALLETIZER

Russell T. Sheehan, 11418 Auburndale Ave., Livonia, Mich. 48150

Filed Jun. 30, 1976, Ser. No. 701,136

Int. Cl.[2] B65G *57/24*

U.S. Cl. 214—6 P **2 Claims**



1. A self-contained unitarily-movable pallet-elevating filled bag palletizer, comprising

an elongated unitarily portable palletizer frame structure having an upper portion and a lower portion and self-containedly holding and supporting all of the below-named palletizer components, as follows:

a longitudinal carriage mounted for longitudinal movement on said upper portion of said frame structure,

a transverse carriage mounted for transverse movement on said longitudinal carriage,

a rotary bag positioner rotatably mounted upon and depending from said transverse carriage,

said bag positioner having side bag entrance opening means and bottom bag discharge opening means including releasable gate means disposed across said discharge opening means,

a filled bag conveyor mounted for longitudinal movement on said frame structure and having a rearward bag-receiving portion adapted to receive bags during loading thereof and having a forward portion disposed adjacent said bag positioner and adapted to deliver bags thereto when said bag positioner entrance opening means is aligned with said forward bag conveyor portion,

a pallet elevator mounted on the lower portion of said frame structure beneath said bag positioner and having thereon a pallet support movable upward and downward relatively to said frame structure,

a pallet magazine mounted on said frame structure in spaced relationship to said pallet elevator and adapted to hold a plurality of pallets in closely-disposed relationship to one another,

a pallet conveyor mpunted on said frame structure extending from said pallet magazine to said pallet support and adapted when energized to conveyor empty pallets one-by-one from said magazine to said pallet support,

power-operated means for moving said longitudinal carriage longitudinally of said frame structure,

power-operated means for moving said transverse carriage transversely of said longitudinal carriage,

power-operated means for rotating said bag positioner,

power-operated means for actuating said bag conveyor,

power-operated means for actuating said pallet conveyor,

power-operated means mounted on said frame structure for actuating said pallet elevator,

and power-operated means for actuating said releasable gate means,

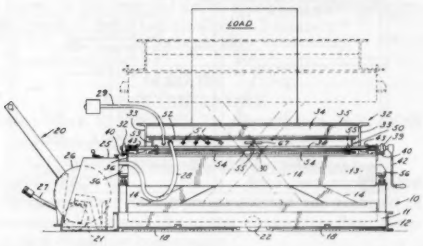
said entrance opening means of said bag positioner comprising open opposite ends thereof adapted to receive bag deliveries at either of said opposite ends from said forward bag conveyor portion in response to rotation of said bag positioner aligning either of said opposite ends with said forward bag conveyor portion.

4,082,195

HANDLING SYSTEM FOR HEAVY LOADS

Alfred B. Wnek, Livonia, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jun. 21, 1976, Ser. No. 698,445
Int. Cl.² B60P *1/60*
U.S. Cl. 214—38 BA **10 Claims**



1. An apparatus for handling heavy or bulky loads which are to be transferred from one location to another wherein said apparatus comprises:

(a) a base means having a first plurality of air bearing means affixedly attached therein interacting with a supporting surface;

(b) a first platform means affixed to a fluid powered ram operated scissors lift means wherein said lift means is fixedly attached to said base;

(c) a second platform means having a second plurality of air bearing means affixed therein coacting with said first platform means wherein said second platform means;

(d) a fluid power means connected to a control and distribution means to operate said first and second air bearing means; and

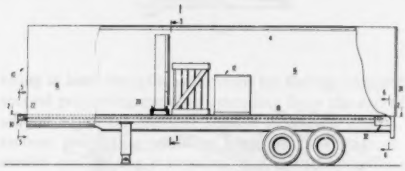
(e) adjustable support means pivotally affixed to said base means and cooperating with said first platform means.

4,082,196

LOADING AND UNLOADING APPARATUS FOR VEHICLES

David William Lutz, and David Edward Lutz, both of P.O. Box 39, Carlisle, Pa. 17013

Filed Apr. 23, 1976, Ser. No. 679,600
Int. Cl.² B60P *1/38*
U.S. Cl. 214—83.22 **41 Claims**



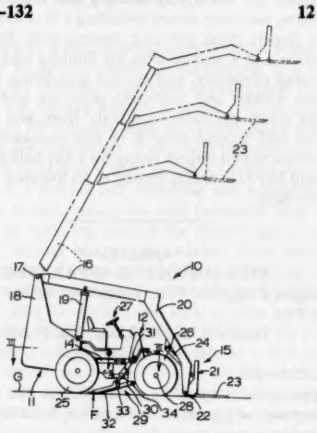
34. A loading and unloading apparatus for a vehicle having a framework, a load carrying floor mounted on said framework, said floor having front and rear ends and a top surface, a plurality of substantially endless load supporting flexible strands mounted on said floor and extending longitudinally thereof, each of said endless strands having a load supporting run and a return run, a beam connected to said strands, means for moving said beam horizontally of said vehicle, said means for moving said beam comprising a pair of drive strips mounted on said vehicle on each side of said floor and extending longitudinally thereof, said strips being fixed to the vehicle, drive means for driving engagement with each of said strips, whereby said beam and said strands are caused to move longitudinally of said vehicle.

4,082,197

ARTICULATED HIGH LIFT VEHICLE

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 12, 1976, Ser. No. 731,604
Int. Cl.² E02F *3/72*
U.S. Cl. 214—132 **12 Claims**



1. A mobile vehicle comprising:

a first frame assembly mounted on a pair of laterally spaced road wheels,

a second frame assembly mounted on a pair of laterally spaced road wheels and pivotally connected to said first frame assembly,

actuating means interconnected between said first and second frame assemblies for selectively pivoting them relative to each other,

work implement means comprising a boom having a first end thereof pivotally mounted on a bracket integrally secured to said first frame assembly and a work tool mounted on a second end of said boom,

work tool cylinder means acting between said work implement means and said first frame assembly, and

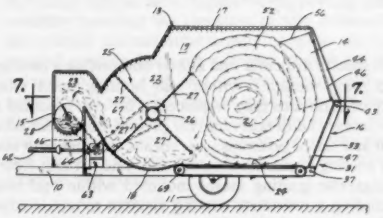
lifting means comprising a pair of double acting lift cylinders pivotally mounted on either side of said second frame assembly for storage therealong when said lift cylinders are maintained in their retracted conditions of operation and ground-engaging means pivotally mounted on said second frame assembly and pivotally attached to said lift cylinders for selectively engaging ground level upon extension of said cylinders to lift said first and second frame assemblies and to lift said first frame assembly relative to said second frame assembly which has its roadwheels maintained in engagement with ground level whereby said first frame assembly can be pivoted relative to said second frame assembly to selectively place said work implement means in an infinite number of work positions about said vehicle, said work tool being movable by action of said work tool cylinder means to a side of said second frame removed from said first frame, the center of gravity of said vehicle being disposed between said ground-engaging means and the roadwheels mounted on said second frame assembly.

4,082,198

BALE HANDLING AND SHREDDING APPARATUS

Clifton W. Anderson, Long Lake, Minn.; John J. Kubik, Des Moines, Iowa; Tom G. Pollock, Blairstown, Iowa; Larry J. Schlict, Sac City, Iowa, and Craig R. Wilcox, Vinton, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 2, 1976, Ser. No. 654,086
Int. Cl.[2] B02C *21/02*; B60P *1/36*
U.S. Cl. 214—519 **2 Claims**



1. Apparatus for handling and shredding a baled fibrous material comprising:

(a) a portable frame,

(b) a housing unit carried by said frame having a top wall, a bottom wall, transversely spaced side walls, a front wall and an open rear side, forming within said housing a rear bale transport chamber means, an intermediate bale shredding chamber means and a front material discharge chamber means, with one of said side walls having an outlet opening at said discharge chamber means,

(c) a conveyor means in said bale transport chamber means extended longitudinally of said bottom wall for moving a bale supported thereon forwardly into said bale shredding chamber means,

(d) a transversely extended bale shredding flail means including a transverse shaft rotatably carried on and between said side walls for rotation about a transverse axis generally vertically centered within said bale shredding chamber means and a plurality of flails axially spaced on and radially extendible from said shaft for rotation of the free ends of said flails adjacent said bottom wall,

(e) means for rotating said bale shredding flail means in a direction to move the free ends of said flails downwardly into the baled material advanced into said bale shredding chamber means by said conveyor means and forwardly along said bottom wall for movement of shredded material forwardly along said bottom wall into said discharge chamber means,

(f) a transversely extended conveyor means in said discharge chamber means for receiving shredded material from said bale shredding flail means having a discharge end at said outlet opening, and

(g) a bale lift structure movably mounted at the rear end of said frame for movement from a lowered bale loading position extended rearwardly from said frame to an elevated position for unloading a bale through said open rear side onto said conveyor means; said lift structure comprising:

(1) a pair of transversely spaced lift arm units,

(2) means pivotally supporting the front ends of said lift arm units on said frame for up and down pivotal movement of the rear ends thereof about a common axis extended transversely of the frame,

(3) a fork unit projected rearwardly from said lift arm units in the lowered positions therefor and including a pair of fork members spaced transversely of said frame,

(4) a first plate means secured to and extended between said fork members over the longitudinal lengths thereof, and

(5) a second plate means secured to and extended between said lift arm units over the longitudinal lengths thereof,

(6) said first plate means and second plate means comprising a closure for the open rear side of said housing unit when the lift structure is in the elevated position therefor.

4,082,199

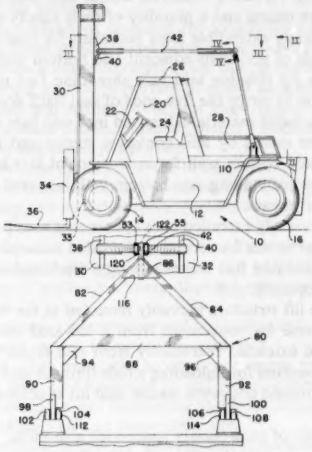
LIFT TRUCK MAST STABILIZER

Larry Dean Friesen, and Richard James Johannson, both of Dallas, Oreg., assignors to Towmotor Corporation, Mentor, Ohio

Filed Jul. 6, 1976, Ser. No. 702,660
Int. Cl.[2] B66F *9/08*
U.S. Cl. 214—672 **6 Claims**

1. In a mast stabilizing means for a lift truck comprising a chassis, a mast having a pair of pivotally mounted, vertically extending, substantially parallel uprights carried by said chassis, stabilizing means pivotally connected to said chassis and to said uprights for stabilizing said uprights against twisting, said stabilizing means comprising a horizontally disposed "A" frame having a pair of legs pivotally connected to the pair of uprights, a vertically disposed "A" frame having a pair of legs with the spaced apart ends of said legs being pivotally connected to spaced apart parts of the chassis of the vehicle, the apexes of the horizontal "A" frame and the vertical "A" frame

being pivotally connected together for movement in a plane perpendicular to the axis of the pivotal connection between



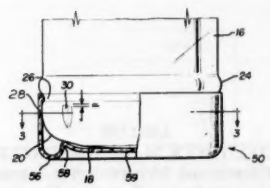
said two "A" frames whereby said "A" frames stabilize said mast relative to said chassis.

4,082,200

PLASTIC CONTAINER WITH SUPPORT BASE, AND METHOD OF ASSEMBLY

Paul Richard Guest, Orange, Conn., and Lawrence D. Ninneman, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 29, 1976, Ser. No. 700,930
Int. Cl.² B65D *23/00*
U.S. Cl. 215—1 C **3 Claims**



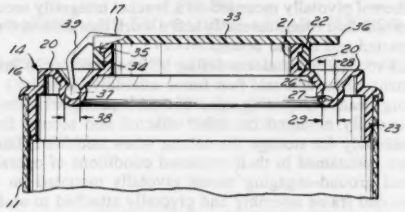
1. In a container having a finish and an endless side wall, and a base joined to the side wall at the bottom thereof, the base having a rounded bottom portion incapable of supporting the container in a stable upright position, the improvement of a continuous groove formed in said container side wall adjacent said bottom for receiving an essentially correspondingly shaped lip of a separate support member, and a slot formed on the outer periphery of the bottle base for facilitating the escape of air upon the assembly of a separate support member onto the container, with the upper margin of said slot terminating about 0.040 inch beneath the peripheral groove so that the support member lip and the peripheral groove may cooperatively define a continuous, essentially water-tight seal around the periphery of the container side wall.

4,082,201

TWO-PIECE END CLOSURE WITH ASSEMBLY DEVICE

Patricia A. Bittel, Bay Village, Ohio, assignor to Weatherchem Corporation, Twinsburg, Ohio

Filed Mar. 11, 1977, Ser. No. 776,549
Int. Cl.² B65D *43/14, 51/04*
U.S. Cl. 220—339 **11 Claims**



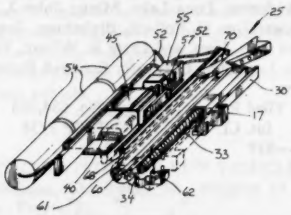
1. A two piece end closure for a container comprising a stationary base and a recloseable cap; said base including a through opening for dispensing the contents of the container and a continuous open trough extending in a circular path completely around said opening; said cap including a cover extending over said opening, and a lug attached to said cover and frictionally received in said trough.

4,082,202

CIGARETTE DISPENSER AND LIGHTER

Mary H. Newsome, 156 Stratford Dr. N.W., Atlanta, Ga. 30311

Filed Aug. 16, 1976, Ser. No. 714,368
Int. Cl.² A24F *15/10*
U.S. Cl. 221—147 **6 Claims**



1. A cigarette dispenser and lighter comprising a housing, an inclined ramp mounted within said housing upon which a plurality of cigarettes may be placed; a lift arm mounted adjacent the lower end of said ramp for pivotal movement between lowered and raised positions; gate means coupled with said lift arm for passing cigarettes singlely onto said lift arm from said ramp; cigarette igniting means mounted within said housing and including a resistance heating element mounted adjacent said lift arm coupled with a source of electrical current through a switch; actuator means for activating said lift arm, said switch and said gate means; and hydraulic brake means mounted adjacent said inclined ramp for braking movement of said actuator means relative said inclined ramp.

4,082,203

APPARATUS FOR HANDLING SUPERIMPOSED STACKED RECEPTACLES

Gilmore T. Schjeldahl, 4436 Marlborough Ct., Minnetonka, Minn. 55343

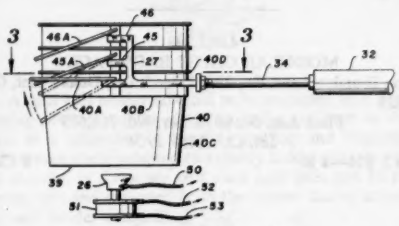
Continuation-in-part of Ser. No. 664,298, Mar. 5, 1976, abandoned. This application Feb. 15, 1977, Ser. No. 768,776
Int. Cl.² B65G *59/06*
U.S. Cl. 221—211 **7 Claims**

1. Container delivery means for sequentially delivering

individual containers from a nested stack, with said containers each having a frustoconical body with a base, an upper rim and an outwardly projecting stacking shoulder formed along said body and spaced from said rim, and a generally semi-circular carrying bail secured to the periphery of said container generally diametrically thereof and along said body between said stacking shoulder and said upper rim and normally engaging the exterior of said frustoconical container at an elevation between said stacking shoulder and the base thereof; said container delivery means comprising:

(a) stacking means for retaining a generally vertical column of said containers in nested relationship, means for intermittent delivery of individual containers onto a receiving surface and including a column supporting delivery control apparatus, said column supporting delivery control apparatus comprising:

(1) a container straddling yoke element having a generally "U" shaped head with a pair of laterally spaced legs arranged to receive a container therebetween and having means for reciprocatorily moving said head along a generally horizontal path between forward and retracted dispositions;



(2) the container engaging surface of said "U" shaped head being normally disposed along a plane spaced from said container receiving surface by a distance greater than the height of said container and having at least one of said legs arranged to engage said carrying bail and pivot said bail upwardly to a generally horizontal disposition for permitting vertical separation of the lowermost container of said generally vertical column; and

(3) column support means engaging said column and including vertical drive means for supporting and controllably lowering the elevation of said column by an incremental amount substantially equal to the normal vertical spacing between adjacent containers in said column so as to drop said column downwardly upon retraction of said "U" shaped yoke from said forward disposition to said retracted disposition and re-position said column vertically to provide for engagement of said legs with the carrying bail on the penultimate container in said column.

4,082,204

CONTAINER-DISPENSER FOR DESICCANT MATERIAL FOR INCLUSION IN A RACKET HANDLE

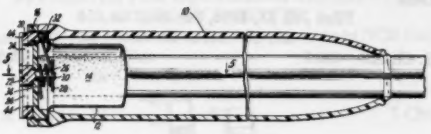
Marc Savage, 6 Horizon Rd., Fort Lee, N.J. 07024

Filed Oct. 28, 1976, Ser. No. 736,390

Int. Cl.[2] B65D *47/20*

U.S. Cl. 222—191 **4 Claims**

1. A dispenser for accommodation within the handle portion of an article such as a racket, or the like, said dispenser being adapted to receive a quantity of drying material and including a cup-shaped container open at one end, a two-piece closure member for sealing off said open end of said container, said closure member comprising a first member having a first plurality of radial slots formed therein, a second closure member axially aligned with said first closure member and having a second plurality of radial slots formed therein and a plurality of ribs arranged intermediate said second plurality of slots, and means in engagement with at least one of said first and second closure members to bias said one of said closure members to a first position with respect to the other of said closure members such that said first and second plurality of slots are not in registration, said second closure member being manually twist-



able against the opposition of said biasing means to a second position at which said first and second plurality of slots are in registration with one another to allow material to escape therethrough, said biasing means being effective to return said second closure member to its said first position upon the release of manual force from said second closure member.

4,082,205

BASE FOR A FINE MATERIAL CONTAINER

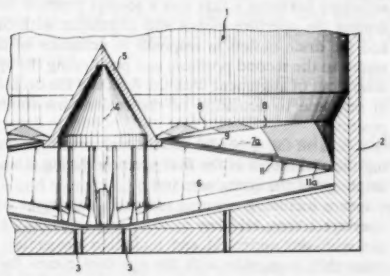
Wolfgang Kluger, Neubeckum, and Jürgen Neumann, Oelde, both of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Jul. 2, 1976, Ser. No. 702,342

Claims priority, application Germany, Jul. 23, 1975, 7523514[U]

Int. Cl.[2] B67D *5/54*

U.S. Cl. 222—193 **12 Claims**

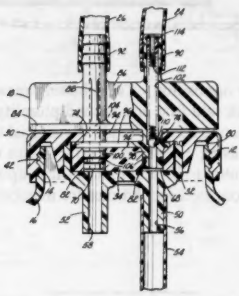


1. A circular base member for a fine material container having a floor provided with a generally centrally located outlet through which such material may be discharged, said base member comprising a bottom having a plurality of circumferentially spaced feed channels therein extending radially inwardly from the periphery of said base member and inclined downwardly toward and in communication with said outlet, the spaces between adjacent channels forming sector-like sections, and a cover interposed between each of said sections and overlying the associated channel, each of said covers being porous for the passage therethrough of aerating gas, each of said covers being inclined downwardly and radially outwardly toward the periphery of said base member, and each of said covers having therein at least one material discharge aperture adjacent the periphery of said base and in communication with the associated feed channel.

4,082,206
CAP ASSEMBLY FOR AQUEOUS AMMONIA CONTAINER

Robert C. Patzke, Prospect Heights; Thomas V. DeRyke, Libertyville, and Frederick D. Meller, Lombard, all of Ill., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Jul. 23, 1976, Ser. No. 708,054
Int. Cl.[2] B65D *83/00*
U.S. Cl. 222—400.7 9 Claims



7. A cap assembly for use with a container for storing and supplying a volatile material, comprising:

a closure member of integral construction adapted to be releasably mounted on a dispensing opening of the container and comprising an upper lid, a lower body and a seal means provided with aperture means;

a feed outlet on the lower body for passage of said material from the container;

a drain outlet on the lower body for passage of said material to the container;

vent means provided in the lower body for venting the container in response to pressure build-up of the material in the container;

said seal means rotatably supported by the lower body for actuation between a first and a second position for positioning the aperture means into alignment with the feed and the drain outlets in response to actuation of the seal means to the second position, and positioning the aperture means out of alignment with the feed and the drain outlets in response to actuation of the seal means to the first position;

lock means on the upper lid and the seal means for maintaining the seal means in the first position during storage and shipment of the container; and

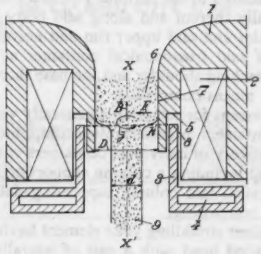
key means including opening means in alignment with the aperture means, said key means being releasably engagable with the upper lid and including projection means releasably engagable with the aperture means for selectively actuating the seal means between the first and second positions.

4,082,207
ELECTROMAGNETIC APPARATUS FOR CONSTRUCTION OF LIQUID METALS

Marcel A. Garnier, and René J. Moreau, both of Grenoble, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Jul. 6, 1976, Ser. No. 702,399
Claims priority, application France, Jul. 4, 1975, 75 21075
Int. Cl.[2] B22D *41/08*
U.S. Cl. 222—594 11 Claims

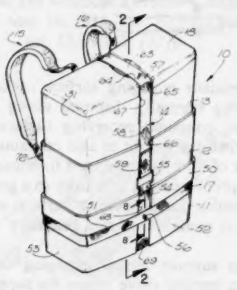
1. Apparatus for constricting a stream of liquid metal, comprising a conduit having an open dicharge end through which the stream of liquid metal issues; an electrical winding disposed around and having a portion extending beyond the discharge end of said conduit, as considered in the direction of flow of liquid metal, means for passing through said winding a high-frequency alternating current thereby generating an overpressure in the stream of liquid metal passing through said discharge end; and an electrical screen including a hollow cylinder consisting of electrically conductive material, said screen being coaxial with and extending into said portion of said winding.



4,082,208
MODULAR CHEST BACK PACK

Gordon Brandon Lane, Jr., 25292 Perch Dr., Dana Point, Calif. 92629

Filed Aug. 30, 1976, Ser. No. 718,679
Int. Cl.[2] A45F *3/04*
U.S. Cl. 224—8 R 9 Claims



1. A back pack comprising:

a plurality of hollow vertically stacked containers which have openings at their upper sides and are separable from one another to allow access to the interior of the containers individually through said openings for placing items therein and removing them therefrom;

said containers being shaped similarly, with vertically successive containers peripherally engaging one another in nesting interfitting relation;

said containers having walls formed of heat insulative material to minimize heat transfer between the interior and exterior thereof;

a cover of heat insulative material for peripherally engaging and closing a top container of the stack and adapted to be opened to permit access to the interior thereof;

a first strap extending vertically about said stack of containers and said cover to secure them together and exert upward supporting force on the stack, and releasable to permit separation of the containers;

a second strap extending horizontally about the bottom container of said stack;

means on said bottom container engaging said horizontally extending strap in a relation to exert upward supporting force on the bottom container and through it the stack from said horizontally extending strap;

two shoulder straps for carrying the stack as a back pack;

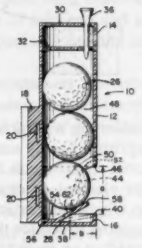
means attaching upper ends of said two shoulder straps to said vertically extending strap at a location spaced above said horizontally extending strap; and

means attaching lower ends of said shoulder straps to said horizontally extending strap at opposite sides respectively of said vertically extending strap.

4,082,209
GOLF BALL HOLDER

Davis J. Sanders, 18030 4th Ave. S., Seattle, Wash. 98148

Filed Nov. 12, 1976, Ser. No. 741,210
Int. Cl.² B60R 9/08
U.S. Cl. 224—29 B 3 Claims



1. A golf ball holder adapted to be mounted to a golf club carrying device, such as a golf bag or a golf cart or the like where it is subjected to possible jostling and impacts, said holder particularly adapted to reliably hold a plurality of golf balls therein, in a manner that such golf balls can be readily inserted into and removed from the holder during actual golf play, said holder comprising:

a. an elongate, substantially rigid, tubular housing having upper and lower ends and having a generally unitary, cylindrical, circumferentially closed side wall, defining an elongate chamber having a diameter moderately larger than the golf balls to be retained, said chamber adapted to retain golf balls in a stacked arrangement at upper and lower locations therein,

b. said housing having at its lower end a forwardly facing cut-out portion, having an edge section defining a loading and dispensing opening moderately larger than the diameter of the golf balls to be inserted into and dispensed from the holder, said edge section being characterized in that it is substantially continuous and has an upper curved edge portion only moderately larger than the golf balls to be retained therein, so as to provide greater reliability in retaining golf balls adjacent said upper edge portion, lateral edge portions having a lateral spacing greater than that across the upper curved edge portion to provide lateral access to a lowermost golf ball in said holder for removal from the holder, and a lower edge portion located at a predetermined level and connecting to the lateral edge portions,

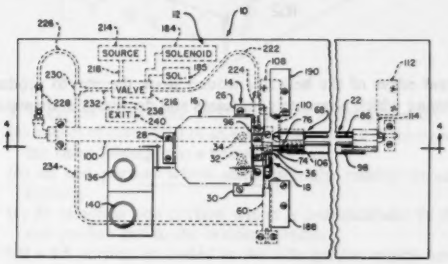
c. means to mount said holder to said golf club carrying device, and

d. a resilient retaining finger cantilever mounted at a lower rear location in the holder at a location beneath the level of the lower edge portion of the loading and dispensing opening, said finger extending upwardly and forwardly to a forward location moderately above and adjacent to said lower edge portion, said finger having an upwardly and moderately rearwardly directed contact face having an upward and forward slant from said rear location to said forward location, so that said contact face engages a lower side of the lowermost positioned golf ball in its normal retained position on a slant to urge said golf ball rearwardly and away from said opening and hold said golf ball in said chamber, said finger having a forward end which in its normal position is at a distance from said edge section less than a distance equal to the diameter of the retained golf ball, whereby the edge section of the housing defining the opening coacts with the finger to retain the lowermost golf ball in the holder, said retaining finger being sufficiently resilient so as to be readily downwardly deflected to permit the lowermost golf ball to be removed forwardly through the opening or inserted into the holder through said opening.

4,082,210
APPARATUS FOR EQUALIZING TENSION IN A RIBBON CASSETTE

James A. Gottschlich, Bellbrook, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 8, 1976, Ser. No. 739,918
Int. Cl.² B65H 17/42
U.S. Cl. 226—91 7 Claims



1. An apparatus for equalizing the tension of a ribbon in a cassette of the stuffed ribbon variety having an exit area and an entrance area between which a first portion of said ribbon is exposed, comprising:

a frame for detachably mounting said cassette thereon;

means for clamping said first portion to prevent said ribbon from being pulled out of said entrance area;

means for pulling a length of said ribbon out of said cassette by pulling said first portion between said clamping means and said exit area; and

means for driving said length of ribbon back into said cassette through said entrance area upon the release of said clamping means;

said pulling means comprising finger means to slidably engage said first portion of said ribbon; said finger means being movable between first and second positions on said frame; and

actuating means for moving said finger means from said first position to said second position to thereby pull out said length of ribbon from said cassette;

said finger means including first and second spaced fingers and said pulling means also including a post which is fixed to said frame; said post being positioned between said first and second spaced fingers when said finger means is located at said first position to enable said length of ribbon to be pulled out of said cassette in multiple sub-lengths so as to maximize said length of ribbon pulled out of said cassette as said fingers are moved from said first position to said second position.

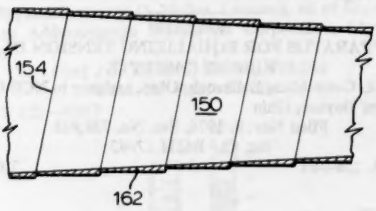
4,082,211
METHOD FOR FABRICATING TAPERED TUBING

Lloyd Elliott Embury, 85 Edenbridge Dr., Islington, Ontario, Canada

Division of Ser. No. 583,449, Jun. 19, 1975, which is a continuation of Ser. No. 408,254, Oct. 23, 1973, abandoned, which is a continuation of Ser. No. 213,327, Dec. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 122,136, Mar. 8, 1971, abandoned, which is a continuation of Ser. No. 738,381, Jun. 17, 1968, abandoned. This application Jun. 2, 1976, Ser. No. 691,971
Claims priority, application Canada, Jun. 16, 1967, 27966
Int. Cl.² B23K 31/06
U.S. Cl. 228—145 15 Claims

1. A method of manufacturing tubing comprising applying pressure to each edge of flat strip-stock in turn so as to impart

alternating parallel curvature to the edges thereof in the plane of the stock, helically winding the stock and joining the adjacent edges of the helically wound stock thereby to produce tubing which alternately increases and decreases in diameter.

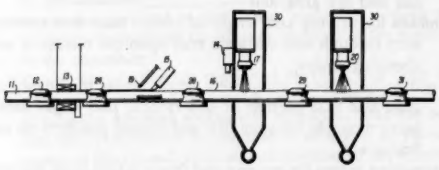


4,082,212

GALVANIZED TUBE WELDED SEAM REPAIR METALLIZING PROCESS

J. Charles Headrick, Oceola, Ark.; R. Emory Starnes, Carrollton, Ga., and Robert C. Peel, Ranburne, Ala., assignors to Southwire Company, Carrollton, Ga.

Filed Mar. 15, 1976, Ser. No. 667,066
Int. Cl.² B23K *31/06*
U.S. Cl. 228—147 **8 Claims**



1. A method of manufacturing zinc coated steel tubing from zinc coated steel strip in which the zinc has been applied directly to the steel strip comprising continuously passing said zinc coated steel strip along a path and sequentially performing thereon the following steps:

a. forming said strip into tubular form and bringing the edges thereof into abutting relation,

b. welding the edges together and thereby volatilizing zinc from the weld area,

c. restoring the zinc coating to the weld area by spray atomization metallizing that area in two sequential stages, said restoring step including continuously sensing the temperature of the weld area and automatically adjusting the point of application of the sprayed coating in response to said sensed temperature,

d. the first stage comprising spraying atomized molten aluminum alloy containing from more than about 0.30 to about 0.95 weight percent iron, with associated trace elements normally present in commercially available aluminum thereon,

e. the second stage comprising spraying atomized molten zinc thereon,

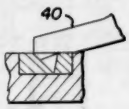
f. the combined coatings applied in steps (d) and (e) providing a coating of substantially the same thickness as the original zinc coating on the steel strip.

4,082,213

METHOD OF MOUNTING A PARTICLE ON A SUPPORT MEMBER

Alexander Rizo Rangabe, 'Stoneacre', Denmead, Portsmouth, Hampshire, England

Division of Ser. No. 526,237, Nov. 22, 1974, Pat. No. 4,001,519, This application Dec. 2, 1976, Ser. No. 747,006
Claims priority, application United Kingdom, Nov. 23, 1973, 54415/73
Int. Cl.² B23K *31/02*
U.S. Cl. 228—171 **13 Claims**



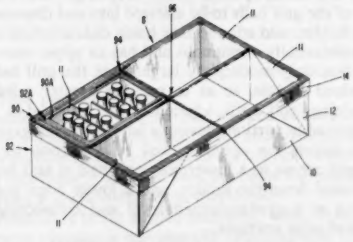
1. The method of mounting a particle of solid material on a support member comprising fixedly securing on a carrier element a mass of material from which the particle is derived, supporting the carrier element to enable machining of said mass of material from which the particle is to be formed, machining the mass of material to reduce the latter to the required particle form thus providing an assembly of the particle on the carrier element, locating the carrier element with the particle disposed in a mould cavity, filling the mould cavity with a solidifiable liquid substance with the particle at least partly immersed in the substance, causing the substance to solidify, removing at least most of the assembly exterior to the solidified substance, attaching a support member exteriorly of the solidified substance on the remaining part of the assembly, and, removing the solidified liquid substance.

4,082,214

CONTAINER ASSEMBLY AND METHOD OF USING

Howard W. Baker, Rte. No. 1, Box 11, Terra Bella, Calif. 93270

Filed May 6, 1977, Ser. No. 794,629
Int. Cl.² B65D *13/04*
U.S. Cl. 229—23 R **8 Claims**



1. A reusable rectangular container assembly comprising:

a master container comprising:

a base portion formed of foldable, non-metallic material and including:

a rectangular bottom wall,

a pair of side walls connected to said bottom wall so as to be foldable between a collapsed position and un upright position at opposite sides of said bottom wall,

a pair of end walls foldably connected to said bottom wall so as to be foldable between a collapsed position an un upright position at opposite ends of said bottom wall, said end and side walls defining a compartment therebetween when disposed in upright positions;

a pair of side flaps connected to opposite ends of each side wall so as to be foldable between a collapsed position and a position lying abreast of and parallel to

an adjacent upright end wall, said side flaps and side walls forming a first substantially right angle corner fold at each corner of the master container,

a pair of end flaps connected to opposite ends of each end wall so as to be foldable between a collapsed position and a position lying abreast of and parallel to an adjacent upright side wall, said end flaps and end walls forming a second substantially right angle corner fold at each corner of the master container, said first and second corner folds at each corner being disposed in upstanding, nested relationship in an erected condition of said container; and

an elastically resilient band removably positioned around upper portions of said end and side walls of said base portion to support said end and side walls in upstanding position; and

a plurality of sub-containers insertable within said master container, each sub-container comprising:

a base portion formed of foldable, nonmetallic material and including:

a rectangular bottom wall,

a pair of side walls connected to said last-named bottom wall so as to be foldable between a collapsed position and an upright position at opposite sides of said last-named bottom wall,

a pair of end walls foldably connected to said last-named bottom wall so as to be foldable between a collapsed position and an upright position at opposite ends of said last-named bottom wall, said last-named end and side walls defining a compartment therebetween when disposed in upright positions;

a pair of side flaps connected to opposite ends of each last-named side wall so as to be foldable between a collapsed position and a position lying abreast of and parallel to an adjacent upright end wall, said last-named side flaps and side walls forming a first substantially right angle corner fold at each corner of the sub-container,

a pair of end flaps connected to opposite ends of each last-named end wall so as to be foldable between a collapsed position and a position lying abreast of and parallel to an adjacent upright side wall, said last-named end flaps and end walls forming a second substantially right angle corner fold at each corner of the sub-container, said first and second corner folds at each corner being disposed in upstanding, nested relationship in an erected condition of said container; and

an elastically resilient band removably positioned around upper portions of said end and side walls of said last-named base portion to support such end and side walls in upstanding positions;

said sub-containers being insertable in side-by-side relation within said master container so that the first and second corner folds of a sub-container are nested within the first and second corner folds at each corner of said master container to provide four upright corner folds at each corner of said master container; and

said corner folds of said sub-containers being of substantially the same height as the corner folds of said master container so that said corner folds of said sub-containers and master container together form a support column for vertical support when a plurality of master containers are stacked;

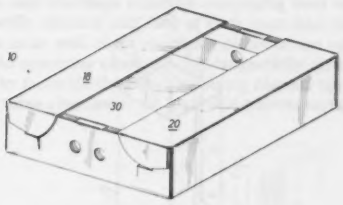
said resilient band of said master container being removable to expose said sub-containers for handling and to enable said master container to be stored for reuse; said resilient band of said sub-containers being removable to enable said sub-containers to be stored for reuse.

4,082,215

CARTON FOR FRUIT AND THE LIKE

Larry L. Eichenauer, 16210 Spinnaker Dr., Crosby, Tex. 77532

Filed Jan. 7, 1977, Ser. No. 757,752
Int. Cl.² B65D *5/30*
U.S. Cl. 229—36 **3 Claims**



1. A carton for holding produce which is comprised of:

(a) a sheet of cardboard of an appropriate gauge of thickness, the sheet folding into a bottom portion;

(b) an end portion which stands upright relative to said bottom;

(c) an attached side portion which is perpendicular to the end portion and to the bottom portion;

(d) a lid portion appended to the side portion which folds over and covers the top of the box when assembled;

(e) a lock tab affixed to a protruding skirt portion on said lid portion which inserts into an appropriately positioned locking slot cut in the end portion and wherein the lock tab extends towards the interior of the box upon insertion;

(f) said end portion further includes a shoulder constructed of multiple layers of the cardboard;

(g) wherein said end portion includes first and second parallel end portions which fold together into a double layer and which clamp between them a folded flap attached to the side portion to secure said side portion in position, and further including a shaped top edge on said end portion and conforming top edge on said folded flap;

(h) wherein said folded flap has a bottom edge located against the bottom of the carton;

(i) a locking slot in said bottom located to receive a protruding tab on said folding flap along the bottom edge thereof;

(j) a cut and scored fold line between the first and second parallel end portions which forms a webbing across the top edge of said shoulder;

(k) wherein said webbing defines a spacing between said first and second end portions to receive said folded flap between them as a means of capturing and holding them in relative position;

(l) holes means formed in said parallel end portion and said folded flap which align to define an opening for lifting of the carton;

(m) wherein said locking slot is an L-shaped cut into the exposed parallel end portion and said lock tab inserts therethrough and is frictionally grasped by said folded flap on insertion; and

(n) wherein said L-shaped slot incorporates a top edge which is horizontal and which defines the bottom edge of a semicircular hole formed into said end portion, and said lock tab is formed into a tapered leading edge for ease of insertion.

4,082,216

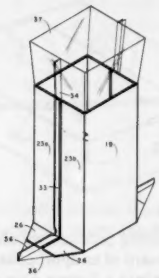
CARTON AND BAG CONTAINER

John W. Clarke, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 7, 1977, Ser. No. 766,274
Int. Cl.² B65D *33/02*
U.S. Cl. 229—55 **3 Claims**

1. The combination of an integral and collapsible interior carton and exterior plastic bag container comprising a paper-

board carton blank affixed along its entire perimeter to a film of plastic sheet material, said carton blank having a base panel with a crease line bisecting it and with front and back panels extending therefrom at opposite front and back edges, a pair of split side panels extending from opposite side edges of each of said front and back panels, first gusset panels extending from



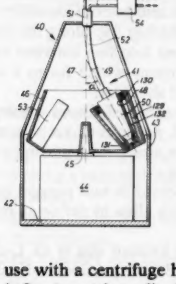
opposite side edges of said base panel, second gusset panels extending from the lower edges of said split side panels, said carton blank being creased for folding along each panel edge from which another panel extends, and said plastic sheet material being cemented together along doubled-over side edges adjacent said split side panels.

4,082,217

CENTRIFUGE APPARATUS

Johan Eric Hayden Westberg, Lidingo, Sweden, assignor to Separex SA, Chatel-Saint-Denis, Switzerland

Continuation-in-part of Ser. No. 391,537, Aug. 27, 1973, Pat. No. 3,885,735. This application Jan. 24, 1975, Ser. No. 544,002
Claims priority, application Sweden, Jan. 28, 1974, 7401046
Int. Cl.² B04B *9/00*
U.S. Cl. 233—25 **34 Claims**



1. Apparatus for use with a centrifuge having a rotor rotatable about a first axis for separating a liquid mixture into fractions of different densities, comprising:

(a) a hollow jacket;

(b) bearing means, adapted to be mounted on the centrifuge rotor remotely from said first axis and engaging said jacket for supporting said jacket for relative rotation with respect to the rotor about a second axis;

(c) flexible inlet and outlet conduits for liquid connected at one end to said jacket;

(d) holder means for holding said jacket against rotation about said second axis, said holder means being adapted to be held stationary by a fixed reference remote from the rotor, and being positively connected to said jacket;

(e) a separation vessel disposed in and rotatably supported by said jacket for relative rotation about said second axis and communicating with said conduit; and

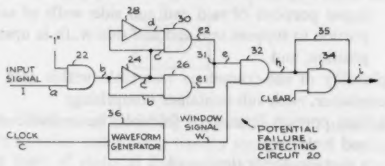
(f) orientation means acting on said vessel for maintaining it in a fixed angular position about said second axis during rotor rotation.

4,082,218

POTENTIAL FAILURE DETECTING CIRCUIT HAVING IMPROVED MEANS FOR DETECTING TRANSITIONS IN SHORT DURATION SIGNALS

Ronald Adam Paulinski, Goleta, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 27, 1976, Ser. No. 754,429
Int. Cl.² G06F *11/00*
U.S. Cl. 235—304 **10 Claims**



1. Potential failure detecting means for detecting the possibility of a potential failure occurring in a digital circuit while the circuit is operating in a data processing system in a normal manner without failure, said potential failure detecting means comprising:

means coupled to a communication line provided between said data processing system and said digital circuit for deriving a test signal indicative of a signal communicated between said digital circuit and said system during actual operation of said circuit in said system;

criteria establishing means for generating a potential failure criteria signal indicative of a predetermined time period;

delay means to which said test signal is applied for producing a delayed test signal;

logic means jointly responsive to said test signal and to said delayed test signal for producing an output signal when said test signal and said delayed test signal have a predetermined polarity relationship; and

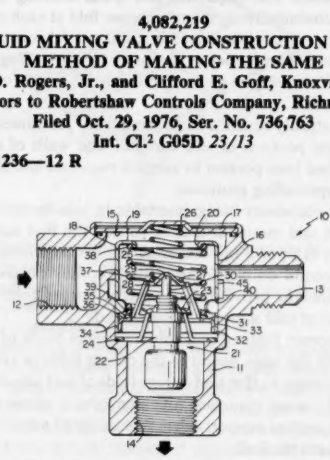
means responsive to said output signal and said criteria signal for indicating whether said output signal occurs during said predetermined time period.

4,082,219

FLUID MIXING VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Arden D. Rogers, Jr., and Clifford E. Goff, Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 29, 1976, Ser. No. 736,763
Int. Cl.² G05D *23/13*
U.S. Cl. 236—12 R **12 Claims**



2. In a fluid mixing valve construction having a housing means provided with a pair of inlets respectively interconnected by a pair of valve seats to an outlet and with valve member means operated by condition responsive means for

controlling said valve seats in accordance with the condition of the fluid passing to said outlet and sensed by said condition responsive means, a second condition responsive means being operatively interconnected to said valve member means to close one of said valve seats with said valve member means if the first-mentioned condition responsive means does not close the one valve seat with said valve member means even though the same is sensing a condition that would require the same to close said one valve seat, said condition responsive means being responsive to the temperature of the fluid that passes to said outlet, the improvement wherein said second condition responsive means comprises a fusible metallic securing means.

4,082,220

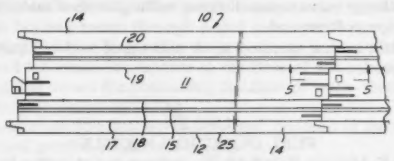
MODEL ROADWAY TRACK CONSTRUCTION

Richard C. M. Cheng, Mantua; Gene Patrick Dennis, Glassboro, both of N.J., and Robert M. Stewart, Langhorne, Pa., assignors to Tyco Industries, Inc., Moorestown, N.J.

Filed Jun. 30, 1976, Ser. No. 701,258

Int. Cl.[2] A63H *19/30*

U.S. Cl. 238—10 F **19 Claims**



1. A track section for a model vehicle, said track section comprising a generally flat elongate body having an upper surface for movement therealong of vehicles, an elongate conductor extending longitudinally along said body and exposed therefrom for contact with a moving vehicle, each end portion of said conductor extending longitudinally of said body and beyond the laterally adjacent portion of said body on one side of the conductor end portion to expose the latter in one lateral direction, and a projection extending from each longitudinal end of said body, each projection having a cam surface, one of said cam surfaces facing in a laterally outward direction toward a side edge of said body and the other of said cam surfaces facing in a laterally inward direction from said last-mentioned side edge, one of said projections having said elongate conductor disposed along a lateral surface of said one projection which is opposite the cam surface of the said one projection, the other of said projections having said elongate conductor disposed in a facing and spaced relationship to the cam surface of said other projection, whereby said track section is engageable in end-to-end relation with an additional essentially identical track section so that the cam surfaces of said first mentioned and additional track sections ride on each other to shift the laterally exposed conductor end portions into side-by-side facing engagement for intimate electrical contact and mechanical juxtaposition.

4,082,221

ROTATABLE ATOMIZER FOR SPRAYING A LIQUID

Johannes Arnold Julius Brummelhuis, Nieuwkoop, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands

Continuation of Ser. No. 607,820, Aug. 25, 1975, abandoned.

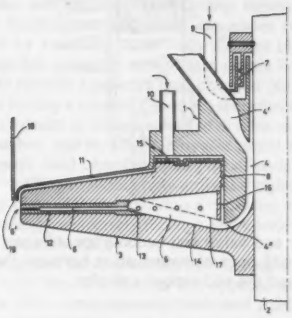
This application Nov. 4, 1976, Ser. No. 738,960

Claims priority, application Netherlands, Aug. 28, 1974, 7411471

Int. Cl.[2] B01D *1/16*; B05B *3/10*

U.S. Cl. 239—214.25 **1 Claim**

1. A rotatable atomizer for spray drying a liquid comprising a stationary supporting member, a supply channel for liquid, and an atomizer disk having an inner atomizing chamber and at least one discharge channel, the atomizer being secured to a vertical rotatable shaft, two labyrinth sealing members, one of said sealing members being placed between the supporting member and the shaft and the second of said sealing members being placed between said supporting member and the atomizer disk, said supporting member having steam supply channels opening into both labyrinths, the discharge channels of the atomizer disk having an outlet with a reduced cross section, each discharge channel comprising a stepped bore having a diameter smaller than that of the other part of the discharge channel, said discharge channels comprising inset tubes with an inwardly directed end face of each inset tube lying flush with the inner wall of the atomizing chamber, the inlet end of the liquid supplying channel being tangentially directed with respect to the shaft, the liquid supplying channel opening into the atomizing chamber at the level of the lower surface of said



chamber in a direction perpendicular to the axis of rotation of the atomizer disk, the bottom of the atomizer chamber being substantially conical, the apex of the conical surface being downwardly directed, the conical bottom extending smoothly and concavely from its periphery toward the end of the supply channel, the edge of the upper surface of the atomizing chamber adjacent to the supporting member being situated at almost the same level as the upper side of the end of the supply channel, the atomizer disk having a ring coaxially around the shaft and limiting the atomizing chamber in an inward direction, said ring extending in a downward direction as far as the upper side of the end of the supply channel, and a jacket enclosing the atomizer and extending in a downward direction to the vicinity of the circumferential edge of a cover plate.

4,082,222

ATOMIZED LIQUID DISPENSING PUMP

Michel Boris, 45 Boulevard Suchet, Paris 75016, France

Filed Jul. 23, 1976, Ser. No. 708,012

Claims priority, application France, Aug. 14, 1975, 75 25833

Int. Cl.[2] B05B *9/04*

U.S. Cl. 239—331 **6 Claims**

1. In an atomizer:

(a) means defining a first cylinder forming a pump chamber;

(b) a dip tube in communication with the pump chamber;

(c) a hollow first piston slidable within the pump chamber, said hollow piston defining a second cylinder in communication with the pump chamber and defining a valve seat;

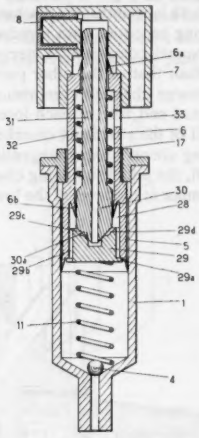
(d) a second piston slidable in said second cylinder and defining a valve member;

(e) an atomizing nozzle in open communication with the said second cylinder through a bore in said second piston said atomizing nozzle being in open communication with said second cylinder only when the valve member and the valve seat are spaced apart;

(f) first resilient means biasing the first piston towards one end of said pump body and second resilient means biasing the second piston towards the other end of said pump body and urging said valve member against said valve seat; and

(g) pressure applied to said first piston causing pressure to

build up in said pump chamber until the biasing force of said second resilient means is overcome and the valve



member and valve seat become spaced apart thus establishing said open communication between the atomizing nozzle and the said second cylinder.

4,082,223

TRIGGER TYPE SPRAYING DEVICE

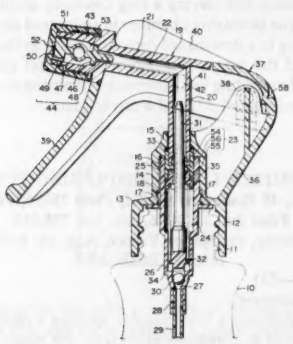
Takamitsu Nozawa, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 732,096

Claims priority, application Japan, Dec. 6, 1975, 50-165534[U]; Dec. 8, 1975, 50-166135[U]

Int. Cl.² B05B *9/043*

U.S. Cl. 239—333 **4 Claims**



1. A trigger type spraying device, for spraying a liquid by using pump pressure, comprising:

a body portion including a cap, for threaded engagement with the neck portion of a container housing a liquid to be sprayed, and a cylindrical portion;

a cylinder member, having a pump chamber defined therein, attached to said cylindrical portion;

a bracket integrally formed with said first cylinder at one side thereof;

a crank lever pivotally mounted upon said bracket, and including an arcuately curved trigger portion and a yoke portion coupled to said trigger portion;

an injection pipe member, including a vertical pipe portion and an oblique pipe portion having a common fluid passage defined therein, disposed interiorly of said yoke;

a pin, projecting laterally from said injection pipe member, engaged in a guide groove formed upon the inside of said yoke portion and serving as a cam means for operative cooperation with said pin;

said vertical pipe portion being slidably disposed within said cylindrical portion and said cylinder member between a first, raised position, and a second, lowered position;

sealing means mounted upon said vertical pipe portion for sealing both said cylindrical portion and said cylinder member when said vertical pipe portion is in said first and second positions, respectively;

spring biasing means disposed within said pump chamber for biasing said vertical pipe portion toward said first position;

said sealing means including an inner cylindrical portion and an outer cylindrical portion, said inner and outer portions being coupled together by means of an annular member interposed therebetween so as to define upper and lower annular spaces within which the lower end of said vertical pipe portion, and the upper end of said spring biasing means, are respectively disposed;

suction valve means disposed within said pump chamber for controlling the fluid flow therein;

discharge valve means disposed within the tip of said oblique pipe portion; and

nozzle means mounted upon said tip of said oblique pipe portion.

4,082,224

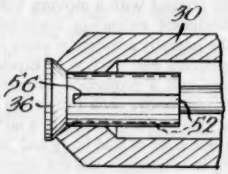
FUEL INJECTION NOZZLE

Ervin E. Mangus, Brimfield, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 7, 1976, Ser. No. 730,492

Int. Cl.² B05B *1/14*

U.S. Cl. 239—453 **5 Claims**



1. A fuel injection nozzle comprising:

a nozzle barrel;

means for delivering fuel to the interior of said barrel;

a fuel delivery port on one end of said barrel

a poppet valve seat on said one end of said barrel and generally concentric with said port;

said nozzle one end being adapted to be received within a combustion chamber or the like and being free of structure surrounding said valve seat;

a poppet valve seatable against said valve seat to close said port;

a valve stem extending through said port into said barrel and having said poppet valve mounted on one end of said stem;

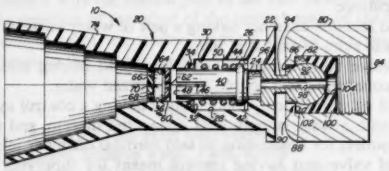
said port slidably engaging said stem to act as a guide for said stem for reciprocating movement of said stem within said barrel; and

a plurality of angularly spaced longitudinal grooves in said valve stem and terminating short of said poppet valve, said grooves being dimensioned so as to extend past said valve seat when said poppet valve is opened to provide plural fuel conduits for the flow of fuel in plural streams from said barrel into a combustion chamber or the like and to be sealed by said valve and said valve seat when said valve is closed to prevent vaporization of such fuel and substantial hydrocarbon emissions, said grooves constituting the sole passageway for fuel flow past said valve seat.

4,082,225
CONSTANT VOLUME AERATED SHOWERHEAD APPARATUS

Kenneth H. Haynes, P.O. Box 12370, Santa Ana, Calif. 92712

Filed Nov. 5, 1976, Ser. No. 738,335
Int. Cl.[2] E03C 1/084
U.S. Cl. 239—428.5 6 Claims

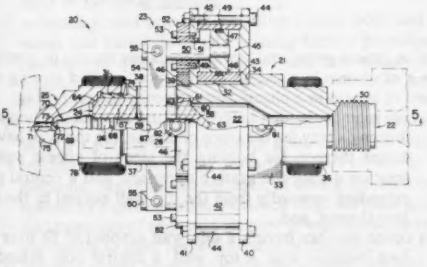


1. Apparatus for providing a substantially constant output of aerated water, comprising, in combination:
housing means for receiving a flow of water;
bore means including a first portion and a second portion in the housing means through which the water flows;
a metering sleeve disposed in the bore means and movable in the bore means in response to the flow of water into the housing means for controlling the flow of water through the bore means, including
an internal bore having an open end disposed in the second portion of the bore means,
a head defining a closed end of the internal bore remote from the open end disposed in the first portion of the bore means, and
slot means for providing for the flow of water from the first portion of the bore means into the internal bore and into the second portion of the bore means;
a chamber for receiving the flow of water from the bore means;
an orifice through which the water flows from the bore means into the chamber;
a disc spaced apart from the orifice and including a central portion against which the water flows from the orifice; and
a plurality of holes extending through the disc adjacent the center portion through which air flows into the chamber for aerating the water and through which the aerated water flows out of the chamber.

4,082,226
SHUT-OFF NOZZLE

Theodore C. Appleman, Mansfield, and Wade L. Wacker, Ashland, both of Ohio, assignors to Eastside Machine & Welding, Inc., Ashland, Ohio

Filed Aug. 16, 1976, Ser. No. 714,625
Int. Cl.[2] B29F 1/03
U.S. Cl. 239—584 7 Claims

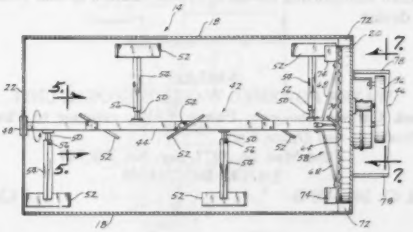


1. A shut-off nozzle (20) for the injection molding of fluid plastics, comprising:
a nozzle body (21) with a bore (22) therethrough for the transmission of fluid plastic, a cylinder mechanism (23) carried by said nozzle body, a core plug and valve assembly (24) positioned within the outer end of nozzle bore head (25) having an outlet bore for delivery of said fluid plastic carried on the outer end of said nozzle body and pressure fluid components (26) for the selective operation of said cylinder mechanism;
said nozzle body (21) having an inner end adapted for connection to the barrel of an injection molding machine, a medial portion for the coaxial mounting of components of said cylinder mechanism and a portion axially inwardly of said nozzle head with opposed axially elongate slots (38) communicating with said nozzle bore;
said cylinder mechanism (23) including opposed radially directed axially inner and outer cap plates (40 and 41) separated by a radially outer body element (42) and fastened together coaxially around said nozzle body medial portion to provide a pressure fluid chamber (45), each said cap plate having a conduit (79 or 80) therethrough for the supply or exhaust of pressure fluid to or from said pressure fluid chamber, and an axially movable piston (47) within said pressure fluid chamber, said piston having dual opposed posts (50) projecting outwardly through said axially outer cap plate (41) and carrying a cross-link component (54) extending transversely through said nozzle body slots (38) and said bore (22);
said core plug and valve assembly (24) having a forwardly opening axial bore (58) therein and opposed axially elongate slots (59) communicating with said axial bore and receiving therethrough said cylinder mechanism cross-link component (54), a bypass bore (60) radially of the said axial bore to transmit fluid plastic from said nozzle bore (22) to said nozzle head (25), a valve stem (66) slidably positioned within said axial bore and actuated by said cylinder mechanism cross-link component, and a valve body (69) carried by said valve stem for selectively opening or closing said outlet bore in said nozzle head.

4,082,227
SLURRY MIXER AND SPREADER

Merle V. McGrane, and Earl F. McGrane, both of Ionia, Iowa, assignors to Bio-Life Company, Inc., Ionia, Iowa

Filed Jul. 21, 1976, Ser. No. 707,353
Int. Cl.[2] B05B 9/00
U.S. Cl. 239—675 11 Claims



1. A mobile slurry mixer and spreader apparatus comprising:
a mobile chassis;
a horizontally disposed cylindrical bottomed tank mounted on said chassis and having a discharge opening at the rearward end in proximity to the bottom of said tank;
valve means disposed within the opening for regulating the discharge of a slurry from said tank;
rotatable mixing means horizontally disposed within said tank, for mixing the slurry within said tank and constantly moving the slurry toward the discharge opening;
a screen drive means;
a rotatable screen attached to said screen drive means and rotated thereby, and disposed within said tank over the discharge opening, whereby debris is prevented from

entering the discharge opening and the slurry is permitted to enter the discharge opening; and

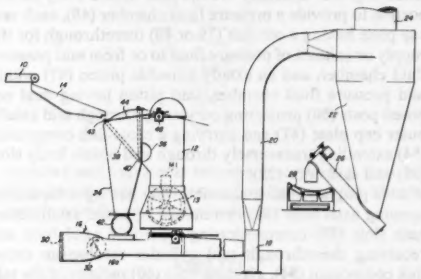
spreader means in fluid communication with the discharge opening for distributing the slurry passing through the discharge opening to the area over which said chassis travels.

4,082,228

AUTOMATIC BYPASS APPARATUS

Malcolm M. Paterson, Lee, N.H., and Ernest N. Yelle, Methuen, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 22, 1977, Ser. No. 771,051
Int. Cl.² B02C *23/02*
U.S. Cl. 241—34 **15 Claims**



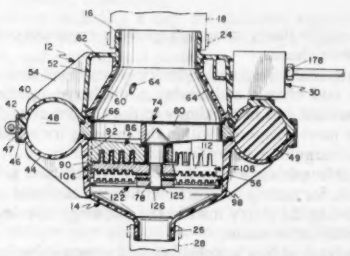
1. A material handling system comprising first material transporting means for moving material from a first location to a second location, a processing device at said second location for receiving said material and including means operable to process material therein, diverting means for detecting inoperation of said processing means and operative in response thereto to automatically divert flow of said material away from said processing device without interrupting the flow of the material from the first transporting means, second material transporting means for receiving material from said processing device and moving it to a third location, and third material transporting means adjacent said processing device, said diverting means including means for directing flow of said material from the first transporting means selectively to said second or third transporting means in bypass relation to said processing device.

4,082,229

WATER POWERED WASTE DISPOSAL UNIT

Frank Carlisle Boosman, Poway, Calif., assignor to Piranha Products, San Diego, Calif.

Filed Mar. 24, 1977, Ser. No. 780,719
Int. Cl.² B02C *18/40*
U.S. Cl. 241—46 B **3 Claims**



1. A water powered waste disposal unit, comprising:

a substantially cylindrical housing having an upper waste material receiving neck and a lower drain outlet;

a plurality of stacked cutters mounted in said housing, certain of said cutters being rotatable;

said housing having an annular toroidal chamber, with a stop plug blocking the chamber at one position;

a piston mounted for sliding movement around said toroidal chamber and having connection means to the rotatable cutters;

said toroidal chamber having a pair of water inlets on opposite sides of said stop plug;

a valve unit coupled to said inlets and having means for connection to a source of pressurized water;

said valve unit comprising a body having a control cylinder with a water supply inlet connected thereto, and supply outlets for connection to said toroidal chamber inlets;

said valve unit having control means for supplying water alternately to said toroidal chamber inlets to drive said piston and the connected cutters with a reciprocating rotary motion;

said control means comprising a control spool reciprocable in the control cylinder with channels for the directing supply water selectively to said supply outlets;

a servo cylinder in said body with a servo spool reciprocable therein, said serve spool having channels for directing supply water selectively to opposite ends of said control cylinder, the opposite ends of said servo cylinder being connected to said supply outlets, whereby the servo spool is responsive to differential pressure on opposite sides of said piston;

a two position detent engaging said servo spool for holding the spool at each end of its reciprocatory stroke;

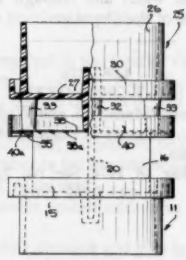
and biasing means loading said detent to prevent movement of the servo spool below a predetermined pressure differential between opposite ends of the servo cylinder.

4,082,230

CHEESE GRATER AND CONTAINER

William E. Bounds, 23790 Hawthorne Blvd., Torrance, Calif. 90505

Filed Apr. 11, 1977, Ser. No. 786,607
Int. Cl.² A47J *43/25*
U.S. Cl. 241—92 **8 Claims**



1. A cheese grater and storage container for use in grating a piece of cheese in a cheese grating position and storing said piece of cheese in a cheese storage position, comprising:

a base member having a side wall forming a stand, a top wall forming a tray for the piece of cheese, the top wall having means thereon for holding the piece of cheese against rotation during the grating operation, and a central post extending upwardly from the top wall normal to the surface thereof, and

a cover member having a side wall adapted to fit over the base member tray, a top wall, a central post extending normally from each of the opposite broad surfaces of said top wall of the cover member, said central posts having apertures formed therein along the longitudinal axes thereof, a grater plate and means for supporting said

grater plate on said top wall of the cover member in spaced relationship therewith and substantially parallel thereto,

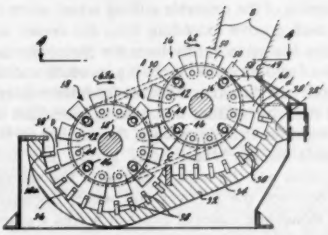
said cover member fitting on said base member with the side wall of the cover member resting on the base member and the central post of the base member fitted in the aperture of one of the central posts of the cover member, thereby forming a container for the piece of cheese in the cheese storage position, said cover member fitting on said base member with the central post of the base member fitted in the aperture of the other of the central posts of the cover member with the grater abutting against the piece of cheese in the cheese grating position.

4,082,231

APPARATUS FOR GRINDING REFUSE

Orval E. Gould, Mission Viejo, Calif. 92675

Filed Dec. 1, 1975, Ser. No. 636,689
Int. Cl.² B02C *13/04*
U.S. Cl. 241—187 **10 Claims**



1. An improved apparatus for grinding refuse of a heterogenous composition, said apparatus comprising:

A. a first rotating element, said element rotating about a horizontal axis and formed of a plurality of coaxial discs spaced from each other axially, each said disc being fixedly secured to an axle extending in said axis to rotate therewith, and each adjacent pair of discs carrying a plurality of hammers between them, each said hammer being rotatingly mounted near the peripheries of the adjacent discs with an arc of rotation extending both between said discs and radially outwardly beyond the peripheries of the discs, the hammers between each pair of discs being in a different angular disposition from the hammers between each adjacent pair of discs;

B. a second rotating element similar to the first element, said second element being disposed to rotate about an axis parallel to the axis of rotation of the said first rotating element, said second element being spaced from the first element both radially and axially in such manner that the hammers of the first and second elements, when said elements are driven in rotation, mesh, but none of the hammers of one element strike the periphery of any of the discs of the other element;

C. a housing, said housing extending around both said elements and therebelow, said housing further providing in conjunction with at least one of said two elements, an entrance for the refuse to be ground and an outlet for the refuse after it has been ground by the apparatus;

D. a grate bed disposed below said elements, said grate bed having a plurality of projecting grate bars, said bars extending radially inwardly toward the axis of one of said elements, the outer end of each of said grate bars being spaced by a predetermined distance from the outer ends of said hammers of each said element as said hammers swing outwardly in their respective arcs of rotation;

E. flexible means interconnecting the axles of the first and second elements to cause the second element to rotate at a predetermined speed of rotation in relation to the speed of rotation of the first element and provide a joint inertial force between said two elements:

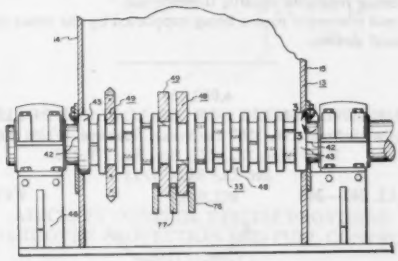
F. a separate powered driving means connected to drive in rotation each of said first and second rotating elements, each of said separate driving means driving the element to which it is connected at said predetermined speed of rotation thereby to provide said joint inertial force between said two elements.

4,082,232

SHREDDER STRUCTURE

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

Filed Mar. 3, 1977, Ser. No. 773,854
Int. Cl.² B02C *13/28*
U.S. Cl. 241—236 **9 Claims**



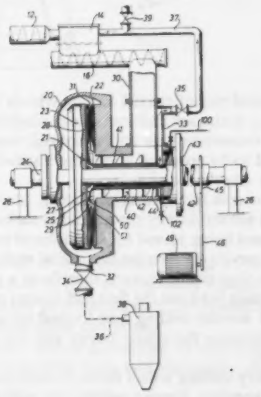
1. In combination, a rotor having a shaft of circular outer cross-section and provided with a series of mutually spaced, annular grooves, plural, mutually spaced blade means mounted upon said shaft and respectively disposed in said grooves, and wherein said grooves have side walls that diverge outwardly.

4,082,233

DISC REFINER HAVING MEANS FOR REMOVING GASEOUS MEDIA FROM PULP STOCK

Rolf Bertil Reinhall, 834, 171 Place NE., Bellevue, Wash. 98008

Filed May 28, 1976, Ser. No. 690,955
Claims priority, application Sweden, Jun. 4, 1975, 7506421
Int. Cl.² B02C *7/11*
U.S. Cl. 241—244 **5 Claims**



1. In a disc-type defibrating apparatus in which lignocellulose pulp stock is ground in a grinding space between the discs which are mounted on a drive shaft to rotate relatively to one another in a housing containing a pressurized gaseous medium and into which the stock is advanced in a feed-in passage from

an inlet to a feed-in opening by conveyor means rotating in a feed-in passage, the improvement which provides separation of excessive high pressure gaseous medium from the gas and stock mixture and permits discharge of the liberated purged gaseous medium without interference with the inflow of stock, said improvement comprising:

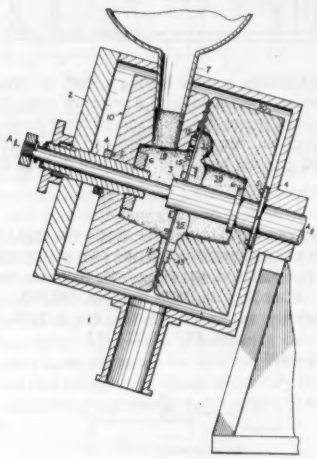
a. centrifuging means in said feed-in opening separating excessive high pressure gas from said mixture and propelling the separated stock particles towards said grinding space while purging the liberated gaseous medium;
b. channel means partitioned from said feed-in passage for withdrawing the liberated purged gaseous medium from said feed-in opening;
c. said centrifuging means comprising at least one impeller member for producing the centrifugal force required for the separation process;
d. said channel means being defined between two concentric sleeves (**42, 44**) co-axially surrounding said drive shaft and being rotatable relative thereto: and
e. said conveyor means being supported by the outer one of said sleeves.

4,082,234

MILLING WHEELS FOR SMALL FLOUR MILLS

Douglas Hoffman, W. 3507 LaCrosse, Spokane, Wash. 99205

Filed Mar. 18, 1977, Ser. No. 779,253
Int. Cl.[2] B02C *7/13*
U.S. Cl. 241—248 **9 Claims**



1. In a matched pair of coaxial milling wheels for small flour mills having a stationary milling wheel adapted to be fixed relative to a transverse axis and a coaxial rotatable milling wheel adapted to be powered about the transverse axis:

said milling wheels each having:

(a) a circular disk having a central axis;
(b) first and second axially spaced radial surfaces formed on the disk and being joined by a peripheral surface;
(c) a center cavity open to the first radial surface on the disk and extending axially inward therefrom a portion of the axial distance between the first and second radial surfaces;
(d) a planar annular milling face formed on said first radial surface between the center cavity and the milling wheel periphery;

said stationary milling wheel further comprising:

(a) a feed aperture formed within the milling wheel and leading from its peripheral surface to said cavity for directing grain inward to the cavity for milling purposes;
(b) said annular milling face having a plurality of grooves having side walls slightly offset from a radian through central axis and substantially perpendicular to the plane of said milling face, said grooves being angularly spaced about the central axis and extending from the center cavity to locations spaced inwardly from the milling wheel periphery of the stationary milling wheel;
(c) each of said grooves increasing in width and decreasing in depth in a direction outward from the center cavity;
(d) said stationary milling wheel being fabricated as an inegral unit from fired stoneware, the exterior surfaces of the stationary milling wheel being glazed and fired during fabrication, and the outermost rim of the annular milling face between its grooves and wheel periphery having fired stoneware material exposed across a plane perpendicular to the central axis;

said rotatable milling wheel further comprising:

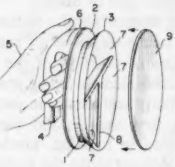
(a) said annular milling face having a plurality of tangentially curved grooves each formed in a teardrop shape, having curved walls progressively enlarged in width in a direction leading outward from the center cavity, each groove being in open communication with the center cavity of the rotatable milling wheel, said grooves being angularly spaced about the center axis and extending tangentially outward in a direction opposite to the intended direction of rotation of the rotatable milling wheel about the center axis, each groove extending from the center cavity to a location spaced inwardly from the periphery thereof;
(b) each of said grooves increasing in width and decreasing in depth in a direction outward from the center cavity;
(c) said rotatable milling wheel being fabricated as an integral unit from fired stoneware, the exterior surfaces of the rotatable milling wheel being glazed and fired during fabrication and the outermost rim of the annular milling face between the grooves and wheel periphery having fired stoneware material exposed across a plane perpendicular to the central axis.

4,082,235

POLE-LESS FISHING RIG

Hector A. Dauvergne, P.O. Box 884, San Leandro, Calif. 94577

Filed Apr. 21, 1976, Ser. No. 678,741
Int. Cl.[2] A01K *89/00*
U.S. Cl. 242—84.2 J **5 Claims**



1. A compact and easily transported pole-less fishing rig having:

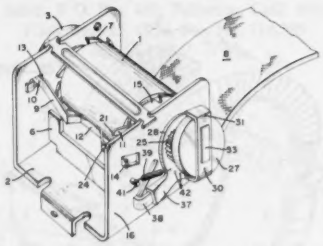
(a) a line containing area formed by a short cylindrical section, a rear face and a flared front lip wherein the short cylindrical section is substantially narrower than the front lip;
(b) an integral, firmly attached handle for manipulation during use and for carrying on the belt; and,
(c) a central compartment area for accessory storage, formed by the flared front lip and covered by a removable plastic lid; wherein,

the flared front lip has an outward flare adapted to act as a control for the successive release of fishing line during casting.

4,082,236
FREE PULL WEB SENSITIVE RETRACTOR

Robert L. Stephenson, Sterling Heights, Mich., and Yogendra S. Loomba, Knoxville, Tenn., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 23, 1976, Ser. No. 753,762
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 B 11 Claims



1. In a safety belt retractor comprising a support, a reel mounted for rotation on said support, seat belt webbing attached to and wound up on said reel, at least one ratchet wheel associated with said reel, and pawl means engageable with said ratchet wheel in response to actuation by an inertial device to prevent rotation of said reel in a belt extending direction, the improvement which comprises:

(a) follower means mounted in said support and biased towards said reel, said follower means comprising:

(i) a web contact portion for contacting said webbing when said webbing is substantially fully wound up on said reel, and

(ii) a ciutch contact portion; and

(b) clutch means mounted for limited rotation with said reel, said clutch means being movable to a first position upon initial extension of said webbing from said reel, to a second position upon rotation of said reel in a retracting direction subsequent to said initial extension and to a third position upon additional extension of said webbing from said reel following said rotation in a retracting directon, said clutch means comprising:

(i) a first portion engageable with said pawl means and blocking said pawl means from engaging said ratchet wheel when said clutch means is in its first position, said first portion no longer blocking said pawl means when said clutch means is in its second position; and

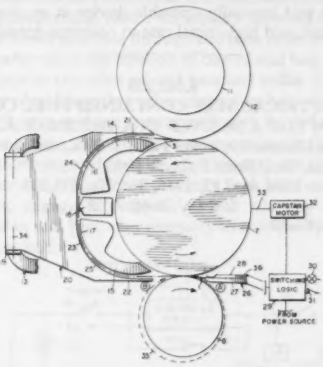
(ii) a second portion engageable with said clutch contact portion of said follower means when said clutch means is in its first position at which said second portion blocks said follower means from movement towards said reel, said second portion no longer blocking said follower means when said clutch means is in its second position, and said second portion engageable with said clutch contact portion when said clutch means is in its third position, thereby preventing said first portion from engaging and blocking said pawl means.

4,082,237
SAFETY PICKER FOR MAGNETIC TAPE LEADER

William A. Buchan, Newport Beach, and Gerhard Rotter, Mission Viejo, both of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 27, 1977, Ser. No. 791,387
Int. Cl.[2] G11B *15/66*
U.S. Cl. 242—192 7 Claims

1. In a self-threading recording-tape transport system in which a take-up reel having a hub, is driven by surface engagement with a rotating capstan, said tape having a leader attached thereto, an arrangement for preventing accidental jamming of the tape during the threading of the tape leader onto the hub of the take-up reel, said arrangement comprising a picker disposed at a point just beyond the area of engagement between the take-up hub and the capstan, for deflecting the

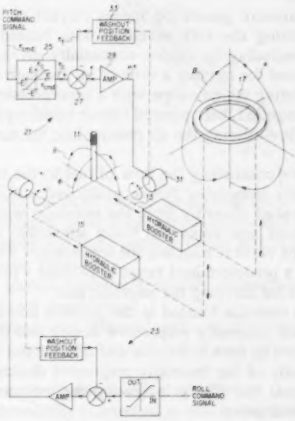


leader away from the take-up hub if the leader fails to properly engage said hub.

4,082,238
AIRCRAFT CONTROL SYSTEM PROVIDING HARDOVER PROTECTION AND FULL CONTROL AUTHORITY

Gordon R. Fabian; James H. McCollum, and Leo P. Kammerer, all of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 5, 1976, Ser. No. 712,130
Int. Cl.[2] B64C *13/02*
U.S. Cl. 244—17.13 5 Claims



1. In a helicopter type aircraft having an autopilot and a manually operable device mechanically coupled through appropriate linkages to a mechanism for changing rotor blade pitch, the improvement comprising:

(a) servomotor means connected to said linkages so as to operate in parallel with said manually operable device, and

(b) means connected between the appropriate autopilot output and said servomotor means for causing said servomotor means, in response to a substantially step function type signal comprising an increase from a value V_0 to a sustained value $V_2 > V_0$ and occurring at said autopilot output, to (i) initially move said manually operable device at a high average rate to a predetermined position ρ_1,

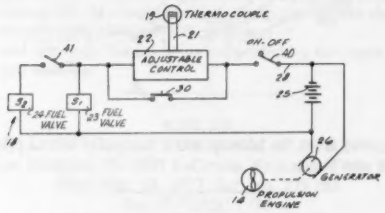
where ρ_1 is a position which would be induced by a step type increase at said autopilot output from V_0 to a sustained value V_1, where $V_0<V_1<V_2$, and (ii) thereafter move said manually operable device at an average rate less than said high initial rate to positions greater than ρ_1.

4,082,239

ALL ELECTRICAL SELF-CONTAINED FUEL CONTROL SYSTEM FOR A BURNER IN A THERMAL AIRSHIP

Douglas B. Obermoller, Sioux Falls, S. Dak., assignor to Raven Industries, Inc., Sioux Falls, S. Dak.

Filed Apr. 12, 1976, Ser. No. 675,953
Int. Cl.[2] B64B 1/62
U.S. Cl. 244—98 **10 Claims**



1. A thermal airship comprising in combination:
an elongate gas envelope of soft flexible material being aerodynamically shaped for horizontal flight providing an outer wall for a hull for the airship;
tail members on the aft end of the airship for controlling the direction of horizontal flight;
a gondola carried below the hull for supporting a payload;
power propelling means supported by the hull for propelling the airship horizontally;
means defining a pressurized inflation opening leading into the hull;
hot air pressure generating means carried on the hull for pressurizing the soft envelope with heated air during flight including an engine continually driving a blower positioned for moving a flow of air through the opening for inflating the envelope with a superpressure;
a first controlled fuel operated burner positioned in the path of air flow heating the air passing into the envelope interior;
a valve for controlling the flow of fuel to the burner;
a thermally responsive device positioned within the envelope spaced inwardly from the envelope wall connected to control said valve and being adjustable to open and close the valve to maintain the temperature within the hull within a predetermined range to provide a predetermined free lift for carrying the payload; and
a manual override located in the gondola connected to bypass said thermally responsive device and connected to the valve to open the valve and operate the burner independently of the thermally responsive device to provide additional free lift by increasing the temperature within the envelope.

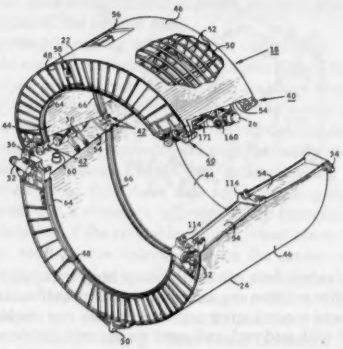
4,082,240

CONTINUOUS INTEGRATED CLAMPING HOOP SPACE VEHICLE SUPPORT SYSTEM

John H. Heathman, and Richard C. Lingley, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Aug. 23, 1976, Ser. No. 716,419
Int. Cl.[2] B64G 1/00
U.S. Cl. 244—158 **3 Claims**

1. In a generally tubular cradle system for supporting a space vehicle in a cargo bay of a reusable launch vehicle during launch and for deploying the space vehicle in outer space, said cradle consisting of two longitudinally divided sections, hinged together along one edge so that one section with a space vehicle secured thereto can be rotated relative to the second section during deployment, the improvement wherein a space vehicle is supported within the closed cradle by a continuous integrated normal clamping hoop system comprising at least two spaced inwardly extending cradle rings secured to the inner surface of said cradle, a first cradle ring having a continuous concave surface groove, the cradle rings other than said first cradle ring having a generally cylindrical surface bounded by two inwardly extending shoulders, at least two



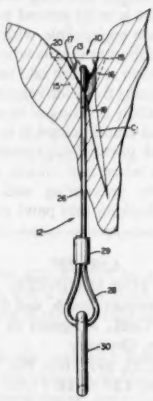
outwardly extending rings around at least a portion of said space vehicle, spaced apart a distance corresponding to the spacing of said cradle rings, a first space vehicle ring having a continuous convex ridge adapted to mate with said concave surface groove, the space vehicle rings other than said first space vehicle ring having a generally cylindrical surface which has a width less than half that of the cylindrical surface of said other cradle rings, and clamping means to press said cradle rings and vehicle rings tightly together when said cradle is closed.

4,082,241

CHOCK FOR MOUNTAIN CLIMBING

John Brent Burkey, 3360 Quivas St., Denver, Colo. 80211

Filed Jun. 17, 1976, Ser. No. 696,906
Int. Cl.[2] A47G 29/00
U.S. Cl. 248—1 **7 Claims**



1. A mountain climbing chock comprising a body portion in the form of a truncated pyramid having a generally triangular cross-section in a plane transversely of the length of said body portion, the sides of said body portion being of unequal widths when measured at any point transversely of the length of said

body portion, a cable-receiving opening disposed along the major, longitudinal axis of said body portion, and

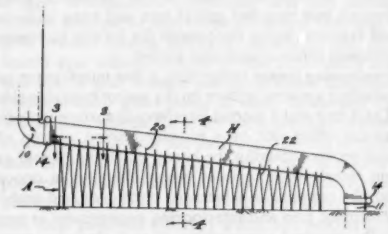
the adjoining corners between the sides of said body converging from one end to the opposite end of said body at substantially corresponding angles with respect to one another.

4,082,242

OMNIDIRECTIONAL SEWER HOSE SUPPORT

James B. Smith, P.O. Box 481, Fullerton, Calif. 92632

Filed Aug. 23, 1976, Ser. No. 716,389
Int. Cl.² F16L *3/00*
U.S. Cl. 248—83 **7 Claims**



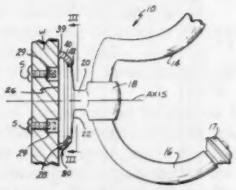
1. A drain hose support for making up vehicle-to-park facility sewer connections, said support having a vehicle connection end and a park facility connection end, and including; a series of like vertically disposed and adjacently related arches of flexible material having coplanar bottom edges adapted for ground engagement and each having a hose supporting header at a fixed height successively diminished progressing from the vehicle connection end to the park facility connection end thereof and opposite side legs depending therefrom, the endmost arches having one free side leg, and interconnecting means at alternately opposite side legs of all intermediate arches joining the series of arches for flexible separation from adjacency and into a longitudinally extended linked relation to supportably engage the drain hose disposed to decline in elevation from the vehicle-to-park facility sewer connections.

4,082,243

COLLAR ATTACHMENT FOR SUPPORT HOOK

William Doyle Watt, Jr., Grand Rapids, and Dale L. Flowerday, Holland, both of Mich., assignors to Keeler Corporation, Grand Rapids, Mich.

Filed Nov. 18, 1976, Ser. No. 743,005
Int. Cl.² F16B *45/00*
U.S. Cl. 248—205 R **17 Claims**



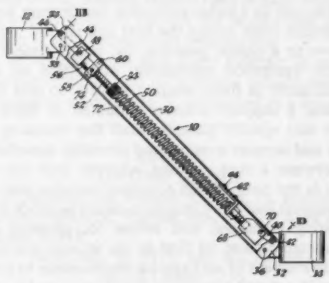
1. A support assembly comprising a support such as a hook for hanging garments and the like and attaching means for attaching said support to a supporting surface; said support including a base for engaging a supporting surface; said attaching means including a collar for holding said base against the supporting surface, said collar having a base-receiving aperture extending therethrough and securing means for securing said collar to the support surface, said collar extending continuously around said base such that said collar engages said base therearound; the length, width and diagonal dimensions of said base being greater than the corresponding dimensions of said collar aperture, at least one dimension of said base being less than one dimension of said collar aperture; said base and collar including cooperating means for initially allowing insertion of only a portion of said base through said base-receiving aperture and thereafter allowing rotation of one of said base and collar with respect to the other of said base and collar to insert the remainder of said base through said aperture behind said collar; said base having a shape corresponding to that of said collar; said collar having recess means corresponding in shape to said base for receiving said base therewithin with the rear surfaces of said base and collar being generally flush after assembly and adapted to engage the support surface whereby said collar with overlap said base after assembly to hold said base against the support surface.

4,082,244

COUNTERBALANCING SUPPORTING DEVICE

Leroy K. Groff, 3115 Oakland Shores Dr., Fort Lauderdale, Fla. 33309

Filed Nov. 1, 1976, Ser. No. 737,327
Int. Cl.² A47F *5/10*
U.S. Cl. 248—280 **6 Claims**



1. A counterbalanced article supporting device to provide vertical adjustment of the supported article which upon release provides a stabilized fixed position of the article comprising:

rigid, tubular encasement;

first and second knuckles pivotably connected to opposite ends of said encasement;

compression spring disposed within said encasement;

spring stop connected to one end of said spring and to said encasement;

a rod partially disposed within said spring;

a block threadably connected to one end of said rod;

a moveable first linkage arm pivotally connected at one end to said block and pivotally at its opposite end to said first knuckle;

a clevis threadably connected to the opposite end of said rod;

a clevis bearing coupled to said clevis and connected to said encasement;

a movable second linkage arm pivotally connected at one end to said clevis and pivotally to said second knuckle at its opposite end;

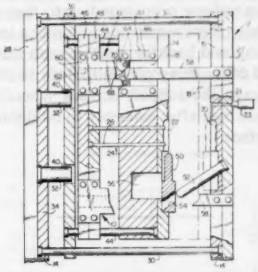
adjustable spring tensioning means connected to said rod and engaging one end of said spring;

said encasement having an aperture in close proximity to said tensioning means, whereby said tensioning means is adjustably accessible from outside said encasement.

4,082,245
EJECTOR RETRACTION MECHANISM

Adelino Claudio Santos, 649 New Britian Ave., Hartford, Conn. 06106

Filed Nov. 26, 1976, Ser. No. 773,052
Int. Cl.[2] B29F *1/14*; B29C *7/00*
U.S. Cl. 249—68 22 Claims

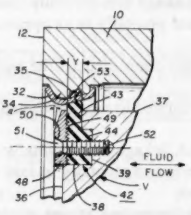


1. In a molding apparatus having a plurality of plates supported in parallel relation for relative reciprocal movement toward and away from each other and including first and second mold cavity plates movable between open and closed positions relative to each other and cooperating in a closed position to define a molding cavity, an ejector mechanism including a ejector plate supported for movement to and retraction from an ejecting position relative to the second mold cavity plate, and an ejector retraction mechanism for retracting said ejector plate before the first and second mold cavity plates move to a closed position, the improvement wherein said ejector retraction mechanism comprises an actuating member mounted in fixed position relative to said first mold cavity plate, a support member mounted in fixed position relative to said ejector plate, at least one blocking member carried by said support member and pivotally movable relative thereto between a first position wherein said one blocking member is in the path of said actuating member and a second position wherein said one blocking member is out of the path of said actuating memnber, and means for pivoting said one blocking member from its first to its second position in response to movement of said ejector mechanisms to its ejecting position, said actuating member being engageable with said blocking member in its second position to retract said ejector mechanism from its ejecting position in response to movement of said mold cavity plates toward closed position.

4,082,246
BUTTERFLY VALVE THRUPORT SEAL

Thomas F. Rothwell, Bradford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 21, 1976, Ser. No. 707,156
Int. Cl.[2] F16K *1/226*
U.S. Cl. 251—307 2 Claims



1. In a butterfly valve including a body defining a fluid passage between an inlet and an outlet, a vane including a defined recess in a face at its periphery and supported in said passage for operation between a first position in which said passage is open to fluid flow and a second position in which said passage is closed to fluid flow, an annular seat on said body extending inward of said passage and an annular gasket having an integral lateral extension on a side face thereof and supported in said vane recess for cooperating with said seat when said vane is in said second position to effect shutoff of said passage to fluid flow, the improvement comprising in combination:

a. clamping means operative for compressing said gasket in an axial direction and effective to radially enlarge said gasket into a controlled sealing interfit with said seat; said clamping means including a ring positioned with a side face bearing against said gasket and a plurality of uniformly spaced individual screw fasteners extending through said ring and gasket into said vane with each of said fasteners being tightenable for locally increasing the clamping force against said gasket;

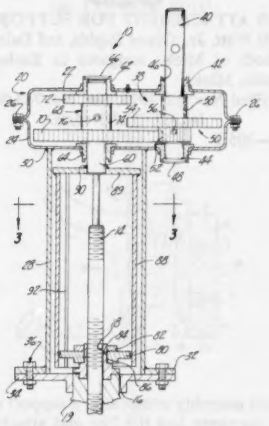
b. constraining means comprising a first interference surface including a coarse texture on the gasket engaging side face of said ring and a second interference surface including an annular offset slot on a radially inward portion of said vane recess receiving the lateral extension of said gasket, said interference surfaces being effective in concert to radially constrain a substantial portion of said gasket in a deforming grip and interlocking engagement in response to the imposed compression of said clamping means by storing energy of compression in said gasket for substantially limiting its enlargement effect to a radial free portion thereof; and

c. means permitting locally limited canting of said ring from a plane extending generally transverse to the axis of the fastener thereat in response to the locally imposed clamping force for generally equalizing the effect of the clamping force between adjacent of said screw fasteners.

4,082,247
VALVE ACTUATOR

Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.

Filed Jan. 26, 1976, Ser. No. 652,530
Int. Cl.[2] F16k *31/53*
U.S. Cl. 251—229 2 Claims



1. A valve actuator for use in conjunction with a valve having a rotatable member, the rotation of which actuates the valve, said actuator comprising:

a drive tube disposed coaxially with and over said rotatable member,

means for drivingly connecting said drive tube and said rotatable member, said means comprising an adapter,

means for securing said adapter to said rotatable member whereby rotation of said adapter produces rotation of said rotatable member, at least one inwardly projecting, axially inwardly extending projection formed along said drive tube, said adapter having an axially extending groove receiving said projection whereby rotation of said drive tube produces rotation of said adapter and said rotatable member, and

means for rotatably driving said drive tube, said means comprising a rotatably mounted drive shaft secured to said drive tube, a vertical rotatably mounted crankshaft spaced from and parallel to said drive shaft and a gearing arrangement disposed between said crankshaft and said drive shaft whereby rotation of said crankshaft effects an opposite rotation of said drive shaft,

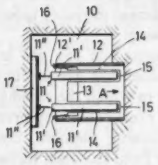
said gear arrangement comprising first and second gear wheels secured to said crankshaft, said first and second gear wheels having different diameters, and third and fourth gear wheels secured to said drive shaft, said third and fourth gear wheels having different diameters, said first and third gears being in mesh when said first and second gear wheels are in one axial position on said crankshaft and said second and fourth gears being in mesh when said first and second gear wheels are in another axial position on said crankshaft, means for fixedly attaching said first and second gears to said crankshaft in either of said axial positions whereby a first and second gear ratio of said gear arrangement is obtained when said first and second gears are respectively in said first and second axial positions on said crankshaft.

4,082,248

PIPE DRIVING APPARATUS

Gerhard Hinrichsen, Munich, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Aug. 15, 1973, Ser. No. 388,507
Claims priority, application Germany, Aug. 24, 1972, 2241695
Int. Cl.² E01G *3/02*
U.S. Cl. 254—29 R **3 Claims**



1. In a pipe-driving apparatus having a plurality of hydraulic rams for driving a pipe section in its longitudinal direction into the ground, the combination comprising:

a. means for supporting the rams at least partly within a pipe section to be driven, and

b. means for transmitting thrust force from the rams to said pipe section,

c. said support means having an annular body including a series of tubular components defining spaces for receiving the rams so that the rams can be disposed in an operating position substantially entirely within the pipe section,

d. said spaces being effective to receive the cylinders of the rams,

e. said support means having a plurality of location members pivotally connected to the annular support body and being movable into an operative position engaging the outer end of the pipe section to thereby transmit the force from the rams to the pipe section,

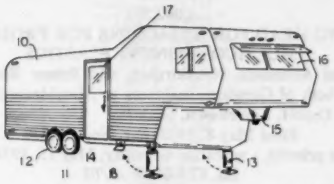
f. each location member has an arcuate-shaped jaw which serves to contact the end of the pipe section over an arcuate length which subtends at least 30° in relation to the axis of the pipe section.

4,082,249

RECREATIONAL VEHICLE LEVELING AND SUPPORT SYSTEM

Joseph M. Valdespino, 5023 Golfclub Pkwy., and Ronald A. Brandl, 3040 N. Pine Hills Rd., both of Orlando, Fla. 32808

Filed Jul. 11, 1977, Ser. No. 814,554
Int. Cl.² B66F *7/26*
U.S. Cl. 254—45 **15 Claims**



1. A recreational vehicle leveling and support system comprising in combination:

a source of water under pressure;

at least one water cylinder connected to a recreational vehicle in a pre-determined position, said water cylinder having an operative position and a storage position for travel;

valve means having a valve connected to said source of water under pressure and to said water cylinder for controlling said water cylinder responsive to operation of said valve means, said valve having a venturi therein connecting said water under pressure through said venturi and out a drain in one position thereof, and to said water cylinder in a second position thereof for raising and lowering a portion of said recreational vehicle; and

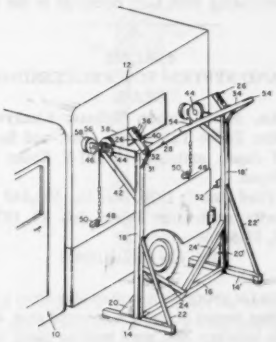
means for locking each said water cylinder in position following leveling of said recreational vehicle whereby said recreational vehicle may be supported in a level position.

4,082,250

LIFTING DEVICE

Leonard G. Allmon, 212 Pelham Rd., No. 11, Knoxville, Tenn. 37814, and Michael C. Allman, Rte. No. 26, Kern Rd., Knoxville, Tenn. 37918

Filed Aug. 30, 1977, Ser. No. 828,987
Int. Cl.² B66F *7/26*
U.S. Cl. 254—47 **5 Claims**



1. An apparatus for lifting and supporting heavy objects such as truck camper covers and the like comprising, a pair of base members, said base members joined by at least one cross beam member, at least one upstanding support member fixedly mounted to said base member, lever means pivotally mounted on said upstanding support member comprising an L-shaped member having a longer arm and a shorter arm, pivotally mounted at the junction of said longer arm and said shorter

arm to an offset projection at the apex of said upstanding support member whereby rotational pressure exerted on said longer arm causes vertical displacement of said shorter arm, said shorter arm of said L-shaped member having spaced attachment means included thereon whereby said load bearing means is adjusted, and having an adjustable load-bearing means coupled to said lever means and locking means pivotally secured to said upstanding support member.

4,082,251

MIXING HEAD FOR A MACHINE FOR PRODUCING MULTICOMPONENT PLASTICS

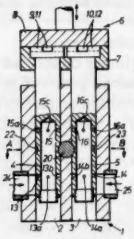
Ferdinand Althausen, Neunkirchen, and Rainer Raffel, Siegburg, both of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed May 8, 1975, Ser. No. 575,770

Claims priority, application Germany, May 15, 1974, 2423631

Int. Cl.² B01F *15/02*

U.S. Cl. 366—179 **4 Claims**



1. A mixing head for a machine for producing multicomponent plastics, comprising a housing; two hollow slides which are guided in bores in the housing between a rest position and a mixing position, and are coupled together through a yoke; a mixing chamber located between the slies, the axis of the mixing chamber being at an angle to a plane in which the slides are situated, and the lateral distance between the slides being less than the width of the mixing chamber as measured in the same direction, the mixing chamber being communicated with ejection openings of the slides when the slides are in their mixing positions; a stripping rod guided in and filling the cross-section of the mixing chamber, the rod being capable of passing between the slides when they are in their rest position by means of recesses in the slides; and feedlines for components to be mixed communicating with inlet openings in the slides.

4,082,252

METHOD AND SYSTEM FOR PROCESSING MOLTEN SLAG

Yoshio Tanaka, Anou; Tatsuo Shibata, Kitakyushu; Tatsuo Matsuo, Oita; Tadao Takashima, Oita, and Sankichi Hori, Oita, all of Japan, assignors to IRI-E Kosan Corporation, Fukuoka, Japan

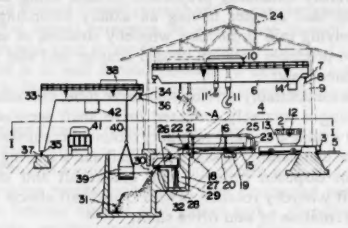
Filed Jun. 7, 1976, Ser. No. 693,443

Claims priority, application Japan, Jun. 13, 1975, 50-72217; May 11, 1976, 51-54168

Int. Cl.² C03B *19/08*

U.S. Cl. 266—142 **13 Claims**

1. Apparatus for processing molten slag from a steel making plant comprising means defining a covered area, a molten slag ladle movable between said steel making plant and said covered area, slag receiving means under said covered area for receiving said molten slag from said molten slag ladle, pivotal means pivotably mounting said slag receiving means, tiltable means for tilting said slag receiving means about said pivotal means, water cooling means disposed over said slag receiving means for discharging water onto said molten slag on said slag receiving means, slag bucket means disposed adjacent to said slag receiving means for receiving said slag when said slag receiving means is tilted by said tiltable means and the slag slides off of said tilted slag receiving means, a cooling water pit submergibly receiving said slag from said slag bucket means



for effecting quenching thereof, and means for transferring said quenched slag from said cooling water pit.

4,082,253

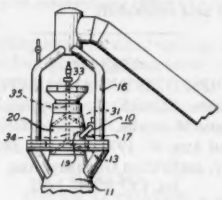
BLAST FURNACE PRESSURE EQUALIZING APPARATUS

Daniel E. Pike, Harrington Park, N.J., assignor to Air Pollution Industries, Inc., Englewood, N.J.

Filed Mar. 17, 1976, Ser. No. 667,627

Int. Cl.² C21B *7/00*

U.S. Cl. 266—147 **2 Claims**



1. An apparatus for equalizing the pressure exerted by top gas, generated during operation of a blast furnace, on one surface of a closing element movably mounted in the top of the blast furnace, comprising:

(a) means for cleaning the top gas in the apparatus and directing the cleaned top gas through the apparatus and into the chamber in which the closing element is movably mounted so as to exert equalizing pressure on the opposite surface of the closing element, comprising means for directing top gas from the blast furnace and for directing a liquid in a dispersed spray into the path of the top gas so that the liquid is reduced into fine droplets and so that pollutants from the top gas are impressed on such find liquid droplets, including a wall portion including flared end portions and a constricted medial portion, and in which one of the flared end portions has openings therein for injection of a liquid therethrough, means for directing the cleaned top gas and the fine liquid droplets with top gas pollutants impressed thereon from the top gas directing means and for separating the fine liquid droplets with top gas pollutants impressed thereon from the cleaned top gas, and means for directing cleaned top gas from the cleaned top gas and fine liquid droplets directing means into the chamber in which the closing element is movably mounted so as to exert equalizing pressure on the opposite surface of the closing element; and

(b) means for generating substantially continuous flow of the cleaned top gas into the chamber in which the closing element is movably mounted, including means for directing liquid in a concentrated stream through a portion of the top gas directing means of the top gas cleaning means, which extends through one of the openings in the flared end portion of the top gas directing means of the top gas

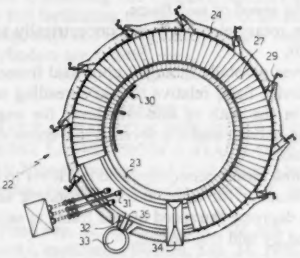
cleaning means, including an outlet portion which extends parallel to the axis of the wall of the top gas directing means of the top gas cleaning means.

4,082,254

HEAT EXCHANGER AND APPLICATION THEREOF TO REALIZE AN ORE REDUCING FURNACE

Ugo Brusa, Via Borgnis, Domodossola, Italy

Filed Aug. 20, 1976, Ser. No. 716,236
Int. Cl.[2] C21B *1/12*
U.S. Cl. 266—175 **5 Claims**



1. Apparatus for reduction of ores, comprising:
(a) an annular chamber having an upper portion and a lower portion;
(b) moving means in said lower portion for supporting said ore;
(c) means for rotating said ore-supporting means along the annular path of said chamber;
(d) means for introducing heat into said upper portion of said chamber for heating said ore;
(e) means for separating said upper portion from said lower portion and consisting of at least one member having an outer surface which is alternately brought into contact with said upper and lower portions of said chamber, said separating means being provided in less than the entire annular area of said chamber;
(f) means for reducing said ore, located in the non-separated region of said annular chamber;
(g) means for introducing said ore to be reduced, located in the non-separated region of said annular chamber; and
(h) means for discharging the reduced ore radially from said annular chamber and located in the non-separated region of said chamber.

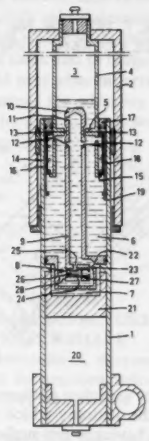
4,082,255

OLEO-PNEUMATIC DAMPER

Jean Masclet, Paris, and Jacques Veaux, Chatillon sur Bagneau, both of France, assignors to Messier-Hispano S.A., Montrouge, France

Filed Jan. 13, 1977, Ser. No. 759,017
Claims priority, application France, Jan. 15, 1976, 76 01015
Int. Cl.[2] F16F *9/06*
U.S. Cl. 267—64 R **6 Claims**

1. An oleo-pneumatic damper comprising: a cylinder; a hollow rod mounted for sliding movement in the cylinder; a low-pressure gas chamber within the cylinder; a first variable volume for hydraulic fluid, provided substantially in the hollow rod and disposed adjacent to the low-pressure gas chamber; a second variable volume for hydraulic fluid, in the hollow rod; a high-pressure gas chamber in the hollow rod; a valve device operatively disposed between said first and second volumes and having a closed position of separating said volumes from each other; and a resilient means disposed in said first fluid volume and operable to urge the hollow rod inwardly of the cylinder whereby the resilient means forms an anti-threshold spring means tending to reduce the minimum



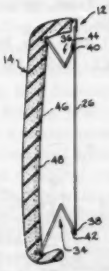
loading on the damper at which the damper commences a compression stroke movement for damping purposes.

4,082,256

SEAT ASSEMBLY

Jack C. Mandusky, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Oct. 26, 1976, Ser. No. 735,171
Int. Cl.[2] A47C *23/00*
U.S. Cl. 267—81 **6 Claims**

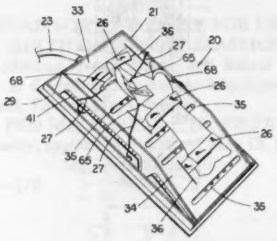


1. In a seat structure, a frame and spring assembly comprising a frame, and a plurality of wire spring members supported at their ends on the frame in generally parallel spaced relationship, the intermediate portions of said wire spring members projecting in a common direction from said frame to define a load bearing spring surface for said seat structure, and a pad supported on and covering said load bearing spring surface, said pad having an inner wall with recesses therein into which said intermediate portions are encased so as to be constrained from shifting with respect to one another, said pad being a foamed elastomer and having an external skin, said recesses being defined by said skin as channel-like structures.

4,082,257
SURGERY TABLE

James W. Strickland, 6969 Warwick Rd., Indianapolis, Ind. 46220

Filed Apr. 7, 1977, Ser. No. 785,406
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—328 11 Claims



1. A surgery table for use when performing a surgical procedure on a portion of the anatomy which comprises:

a support platform having a top surface, a base, and sides extending between said top surface and said base, said platform having at least one opening for drainage of fluid from the top surface;

a drain pan having a support surface upon which said support platform rests, said pan having a lip around its perimeter, said lip extending above the support surface of said pan thereby forming a reservoir capable of collecting fluid which drains through said opening from the top surface of the support platform, said lip having an aperture therein;

a flexible tube having one end connected to said aperture for draining fluid from the reservoir;

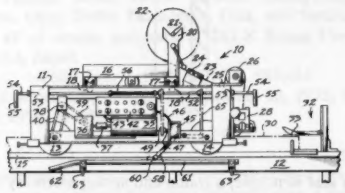
first means for securing to the top surface of said support platform a portion of the anatomy; and

second means for holding in position pieces of the anatomy so that the pieces do not interfere with performance of a surgical procedure.

4,082,258
DRIVE SPEED CONTROL APPARATUS FOR CLOTH SPREADING MACHINE

Hoyt L. Smith, Nashville, Tenn., assignor to Cutters Machine Company, Inc., Nashville, Tenn.

Filed Dec. 27, 1976, Ser. No. 754,172
Int. Cl.[2] B65H *29/46*
U.S. Cl. 270—31 6 Claims



1. In a cloth spreading machine having a frame supporting a spreading mechanism adapted to spread cloth upon a spreading surface as the frame moves longitudinally reciprocably over the spreading surface, drive speed control means comprising:

a. a motor operatively connected to said frame for driving said frame over said spreading surface,

b. a speed control device operatively connected to said motor to vary the speed of said frame,

c. said speed control device having an operator element adapted to actuate said speed control device to vary the speed of said frame in response to the position of said operator element,

d. an elongated control shaft having an operator portion and an end portion,

e. means rotatably mounting said control shaft on said frame for rotation about the longitudinal axis of said control shaft,

f. a handle member fixed to said end portion of said control shaft whereby said control shaft is manually rotated,

g. first link means operatively connecting the operator portion of said control shaft to said operator element, whereby rotation of said control shaft commensurately varies the speed of said frame,

h. a driven rotary element fixed concentrically to said control shaft,

i. a trip lever pivotally mounted upon said frame,

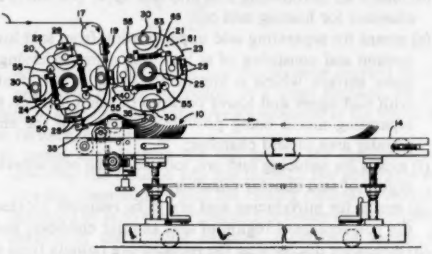
j. a trip device fixed relative to said spreading surface at a station in the path of said trip lever for engaging and pivotally moving said trip lever as said frame moves over said station,

k. second link means connecting said trip lever to said driven rotary element for simultaneously rotating said control shaft to decrease the speed of said frame as said trip lever is moved by said trip device.

4,082,259
CYLINDER FOLDER

Robert John Anderson, Dayton, Ohio, assignor to Harris Corporation, Cleveland, Ohio

Filed Dec. 8, 1976, Ser. No. 748,764
Int. Cl.[2] B65H *45/16*
U.S. Cl. 270—73 1 Claim



1. In a high speed cylinder type folder for folding a continuous web in zig-zag fashion, the folder including a pair of substantially hollow driven cylinders having outer cylindrical walls and being mounted with their axes of rotation in parallel adjacent relation, the walls defining a nip adapted to receive the web therebetween, grippers and tucker blades mounted lengthwise in the walls of each cylinder, each gripper on one cylinder being arranged in opposed cooperating relation with a blade on the other cylinder, and vice versa, whereby the blades alternately tuck the web into the grippers on alternate cylinders at longitudinally spaced intervals along the web in response to rotation of the cylinders, the grippers being controlled such that lengths of the web are pulled away from the nip and held by the grippers in contact with portions of the associated outer cylindrical walls of first one and then the other of the cylinders before release of the grippers, and stripper means operative to guide the folded web from the grippers and cylinders upon release of the grippers, the portions of the outer walls having formed therein a series of spaced apart shallow recesses opening outwardly in a circumferential direction around each cylinder and having bottoms slightly depressed with respect to the outer cylindrical walls, the recesses being separated by relatively narrow ribs which are adapted to

contact the web and which form the sides of the recesses, the improvement comprising:

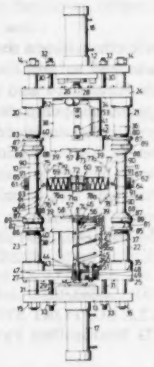
means defining openings communicating through the walls of both cylinders from the hollow interiors thereof into the bottoms of the recesses, said openings being distributed across and around each cylinder to provide for a flow of air through said openings in the region between the nip between the cylinders, the web and the web stack for aiding the release of the web as it is engaged by the stripper means and for equalizing and relieving pressure in said region as the web is being delivered to and formed into the zig-zag folded stack, and means providing passageways through the cylinder ends placing the hollow interiors thereof in communication with the surrounding atmosphere for connecting the cylinder interiors to ambient pressure and facilitating the movement of air through said end passageways and through said cylinder wall openings as the cylinders are rotated.

4,082,260

ADJUSTABLE APPARATUS FOR SEPARATING AN OUTERMOST LABEL FROM A STACK OF LABELS

Karl Östen Alf Nilsson, Spanga, and Curt Oskar Lindell, Taby, both of Sweden, assignors to Toolex Alpha AB, Sundbyberg, Sweden

Filed Sep. 21, 1976, Ser. No. 725,248
Claims priority, application Sweden, Sep. 24, 1975, 7510707
Int. Cl.[2] B65H *1/28, 3/22, 3/44*
U.S. Cl. 271—1 **12 Claims**



1. An apparatus for separating articles one by one from a stack of articles in a repeated operation comprising:

a magazine housing said stack of articles, said magazine containing a supporting plate acting on one end of said stack of articles, a resilient means for urging said supporting plate toward an open end of said magazine, and a retaining means mounted on said open end for retaining said stack of articles in said magazine against the force of said resilient means, said retaining means having a shape which allows access to the surface of the outermost article in said stack,

a pair of frictional members containing respective article engaging elements, said frictional members symmetrically located on either side of the central axis of said magazine, and being mounted on respective cam followers which are pivotally mounted and biased to keep said article engaging elements retracted away from said magazine,

a pair of cam surfaces for engagement with respective cam followers, said cam surfaces causing said cam followers when engaged therewith to move said article engaging elements against said bias toward the outermost article of said stack,

means for reciprocally moving said magazine relative to said article engaging elements including means causing said cam followers to move into engagement with said cam surfaces to thereby produce a movement of said article engaging elements into dogging contact with the outermost article of said stack, and for causing said engaging elements to move toward each other while they are in dogging contact with said outermost article to thereby slide said outermost article with respect to the next adjacent article in said stack and to bulge said outermost article away from said next adjacent article, and

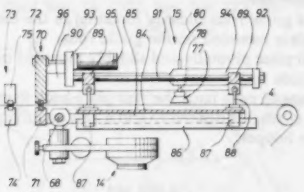
a cam positioning means for adjusting the distance which must be traveled by said cam followers before engaging the respective cam surfaces during said relative movement.

4,082,261

MACHINE FOR THE MANUFACTURE OF OBJECTS OF SHEET SHAPE

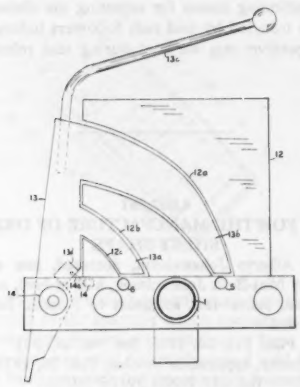
Tor Gustav Alberto Johannisson, deceased, late of Lysekil, Sweden (by Maj-Britt Johannisson, heir-at-law), and by Tom Johannisson, heir-at-law, assignors to Flodins, Industri AB, Lysekil, Sweden

Filed Feb. 26, 1976, Ser. No. 661,501
Claims priority, application Sweden, Feb. 26, 1975, 7502134
Int. Cl.[2] B65H *29/16, 29/32*
U.S. Cl. 271—69 **3 Claims**



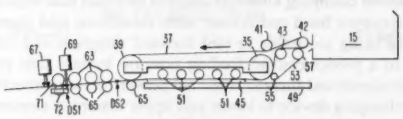
1. An apparatus for the transportation of objects formed of sheet material produced from foil webs thereof moving stepwise in a forward direction from a feed station to a discharge station at the end of a conveyor band, comprising a first power means, feeding means for providing stepwise forward movement of the conveyor band and the objects supported thereby, said feeding means, including a clamping device having upper and lower clamping elements adapted to retain said objects on the conveyor band and release same therefrom; said clamping device being moveable in said forward direction and returnable to a predetermined feeding position by said first power means connected thereto, a second power means connected to said clamping device to lower said upper clamping element for movement in the forward direction and elevate said element during its movement in the return direction, discharge means to remove said objects from the conveyor band at said discharge station, said discharge means comprising carrying means connected to said upper clamping element and moveable therewith in the same directions as the latter, said carrying means being provided with suction cups for engaging said objects on the conveyor when moving in the forward direction, means communicating said suction cups with a source of vacuum during said forward movement and disconnecting same from said source when in a position to discharge said objects, said suction cups being disposed to secure each successive object as it nears the end of the conveyor band in stepwise movement while said upper clamping element and suction cups are in a lowered position, and to release each object beyond the end of the conveyor and, at which point said suction cups are elevated with said upper clamping element and returned to a position for feeding another object in the forward direction.

4,082,262
FEEDER HOPPER FOR DOCUMENTS
Clement R. Konars, Glen Cove, and Emanuel Quinci, Dix Hills, both of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.
Filed Feb. 14, 1977, Ser. No. 768,147
Int. Cl.[2] B65H *1/02*
U.S. Cl. 271—149 3 Claims



1. A feeder hopper for documents comprising,
a base member,
a pair of guide rods slidably mounted in the base member,
a rear plate mounted on the guide rods,
a second plate pivotally and slidably mounted on one side of the guide rods,
and means to push back the rear plate back from the second plate when it is desired to add a new supply of documents to the hopper.

4,082,263
DOCUMENT FEEDING APPARATUS
John G. Baumberger, Johnson City; Michael A. Gazy, Apalachin, and William C. Miller, Owega, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 591,782, Jun. 30, 1975, abandoned.
This application Feb. 4, 1977, Ser. No. 765,503
Int. Cl.[2] B65H *5/00, 5/02*
U.S. Cl. 271—266 3 Claims

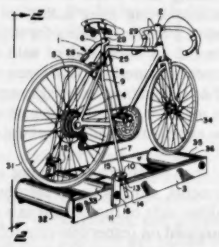


1. Document handling means comprising in combination,
a document receiving station for receiving manually inserted original documents of varying lengths,
a document copying station,
document transport means for transporting said documents to and through said copying station,
document feed means at said receiving station for feeding a document from said receiving station to said transport means,
document measuring means for providing an output when said documents are greater than a predetermined length, said document measuring means comprising first and second document sensors spaced along the path of document travel from said receiving station to said copying station,
and document transport control means governed by circuit means including said first and second document sensors, said document transport means including an incrementing clutch means for operating said transport means to provide increments of motion equal to said predetermined length when said document measuring means provides said output.

4,082,264
STATIONARY EXERCISE BICYCLE
James P. Santos, 223 Rockingstone, Larchmont, N.Y. 10538
Filed Dec. 7, 1976, Ser. No. 748,198
Int. Cl.[2] A63B *69/16*
U.S. Cl. 272—73 2 Claims

1. An exercise bicycle comprising a stationary frame, pneumatic pump means attached to said frame and including a rotatable shaft, pedals secured to said shaft for producing rotation thereof, said pneumatic pump means further including a chamber, a plurality of radial vanes secured to said shaft in said chamber, an inlet in communication with the ambient atmosphere and with said chamber, and an outlet air-restricting valve in communication with said chamber and allowing air, acted upon by said vanes in said chamber, to flow therethrough and thence to an outlet to the ambient atmosphere.

4,082,265
BICYCLE SUPPORT SYSTEM
James R. Berkes, 3572 Metropolitan Pkwy., North Royalton, Ohio 44133
Filed Jun. 26, 1975, Ser. No. 590,465
Int. Cl.[2] A63B *69/16*
U.S. Cl. 272—73 10 Claims



1. An apparatus for supporting a cycle-type vehicle on a stationary training device comprising elongate legs for supporting such vehicle on such device in a generally upright position for riding, coupling means for coupling such vehicle and such legs, connecting means for movably connecting said legs to such device, said legs, coupling means and connecting means permitting a leaning action of such vehicle with respect to such device while still providing such support, and means

for varying the tension in said elongate legs correspondingly to vary the amount of leaning action permitted.

4,082,266

ELECTRICAL MOTOR POWERED JUMP ROPE APPARATUS

Nate Elkins, Alhambra, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 5, 1976, Ser. No. 718,782
Int. Cl.² A63B *5/20*
U.S. Cl. 272—75 **1 Claim**

1. A powered jump rope apparatus comprising a vertical member adapted to be supported on a horizontal surface, a stand carried by said vertical member, a motor mounted on said stand, said motor having an output drive shaft extended externally therefrom, and

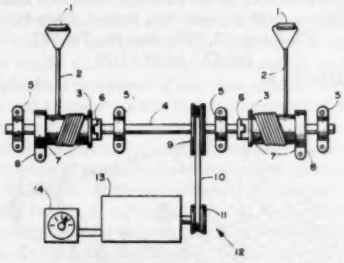
means to attach each of two ends of a flexible cable to the external section of the drive shaft, said means separated by a sleeve mounted over the drive shaft so as to freely rotate about the said shaft, said sleeve being of an external diameter to be grasped by the hands of a person using the apparatus.

4,082,267

BILATERAL ISOKINETIC EXERCISER

Evan R. Flavell, 841 Solano Ave. No. 5, Albany, Calif. 94706

Filed May 12, 1976, Ser. No. 685,446
Int. Cl.² A63B *21/00*
U.S. Cl. 272—125 **12 Claims**



1. Bilateral isokinetic exercising apparatus, comprising:

a plurality of limb-engageable input means for responding to a power stroke in a power direction of reciprocating movement, so that a person exercising can move each input means with one limb in the power direction,

a plurality of converting means each connected to one only of said input means for converting the reciprocating movement of each said input means into a separate rotational motion, each said converting means including its own rotatable member that is acted on by that rotational motion,

a single speed regulating means for opposing rotational movement of any and all said rotatable members with proportioned isokinetic resistance,

driving connection means for connecting all said rotatable members to said speed regulating means and including separate one-way clutch means for connecting each said rotatable member to said speed regulating means and transmitting connection means for each said clutch for providing that movement of each input means in a first power direction drives said speed regulating means, and for providing that movement of each said input means in the opposite direction is disengaged from said speed-regulating means,

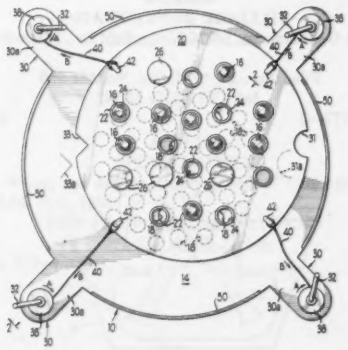
whereby motion of each input means in the power direction by the person exercising is opposed by said speed-regulating means with a resistance force proportional to the force applied by the person exercising, whereas movement of each said input means in the opposite direction is unopposed by said speed-regulating means.

4,082,268

BALL GAME WITH ALIGNABLE APERTURES

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sep. 16, 1976, Ser. No. 723,796
Int. Cl.² A63F *7/02*
U.S. Cl. 273—1 R **23 Claims**



15. A game apparatus, comprising:

a base for positioning on a supporting surface and having means defining an upper generally flat playing surface for supporting a plurality of playing pieces for movement thereof, and including means defining a plurality of spaced recesses randomly spaced from one another for receiving the playing pieces;

a plurality of playing pieces movably supportable on said playing surface; and

a plate-like manually manipulatable member positionable on top of said playing surface for selective sliding movement thereover in all directions in the plane parallel to the plane of the playing surface, said manually manipulatable member having a plurality of apertures therein for receiving the playing pieces in gravity abutment with the playing surface, the apertures in said member being randomly spaced from the recesses in said playing surface and larger than the playing pieces whereby the playing pieces can drop through the apertures into the recesses in said playing surface when aligned therewith.

4,082,269

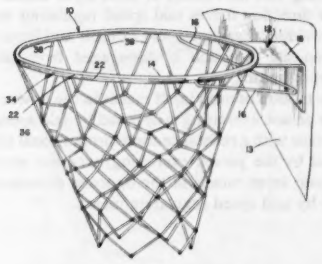
PROTECTIVE BASKETBALL HOOP

Robert L. Hill, Shandon Star Rte., Paso Robles, Calif. 93446

Continuation-in-part of Ser. No. 711,059, Aug. 2, 1976, abandoned. This application Jun. 30, 1977, Ser. No. 811,547

Int. Cl.[2] A63B *63/02*

U.S. Cl. 273—1.5 R 13 Claims



1. A protective basketball hoop having a netting formed from a plurality of strands and a mounting bracket, wherein said protective hoop comprises:

an annular rim member attached to said mounting bracket;

an annular net-supporting body circumfused substantially about the peripheral portion of said rim member; and

net-mounting means integrally formed to said net-supporting body, wherein said net is mounted thereto.

4,082,270

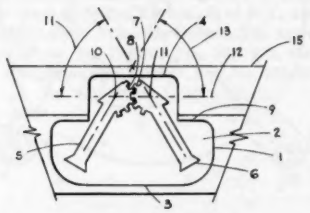
BILLIARD BANKING AID

Frederick G. Josenhans, 14020 Netherfield Dr., Midlothian, Va. 23113

Filed Apr. 29, 1976, Ser. No. 681,550

Int. Cl.[2] A63D *15/00*

U.S. Cl. 273—2 3 Claims



1. A device for training in banking skill in the game of billiards comprising:

a. a substantially flat, rigid base having at least one straight edge and two holes, said straight edge disposed in parallel relationship to the line connecting the centers of said two holes,

b. two essentially flat elongated pointers of substantially mirror-image structural identity, each rotatably supported above said base by a pivot pin engaging with one of said holes, and containing adjacent its forward pointing extremity a series of gear teeth disposed in an arcuate path whose center of curvature coincides with said pivot pin, said pointers being positioned in opposed coplanar relationship causing mating of said teeth such that, at any acute angle of the longitudinal axis of one pointer with said line, the opposed pointer will present an acute angle of equal value on the same side of said line but in the opposite direction, and

c. means for retaining said pivot pins within said holes.

4,082,271

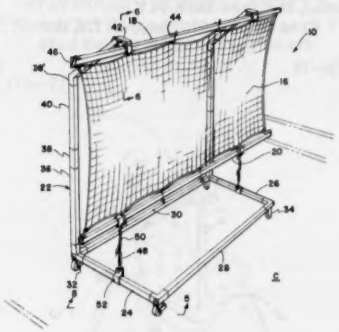
TENNIS PRACTICE AND TEACHING REBOUNDER

Arthur Lee Martin, 2876 N. Rogers Ave., Ellicott City, Md. 21043

Filed Apr. 29, 1976, Ser. No. 681,762

Int. Cl.[2] A63B *61/00*

U.S. Cl. 273—29 A 15 Claims



1. A tennis practice rebounder comprising: a frame, a net wall having upper and lower and end margins and a front, means for suspending the net wall by the upper margin including a first standard on the frame and means for attaching the upper margin thereto, means for adjustably tensioning the net wall between the upper and lower margin including means for pivotally adjusting the lower margin about the upper margin for setting the vertical angle of the net wall; the means for pivotally adjusting including a pair of frame portions below and in fore and aft relation to the lower margin, means for drawing the lower margin toward the frame portions including: a second standard, means for attaching the lower margin to the second standard thereby providing the second standard with net-wall-tensioning connection through the net wall with the first standard; and means for movably attaching the second standard to the respective frame portions, including respective first and second serially related length adjustments proximate each end of the second standard.

4,082,272

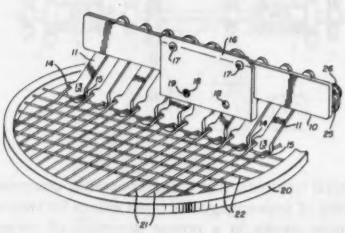
TENNIS RACKET STRING POSITIONING DEVICE

John P. Garver, 9450 Sharrott Rd., Poland, Ohio 44514

Filed Aug. 23, 1976, Ser. No. 716,987

Int. Cl.[2] A63B *53/14*

U.S. Cl. 273—73 A 5 Claims



1. A tennis racket string positioning device for engagement with one set of parallel strings of a tennis racket comprises an elongated body member for positioning transversely of said parallel strings, a plurality of longitudinally spaced pivots on said elongated body member and a plurality of longitudinally spaced depending elongated fingers, the upper end of each of said depending fingers being movably engaged on one of said pivots, inwardly extending notches in the opposite sides of

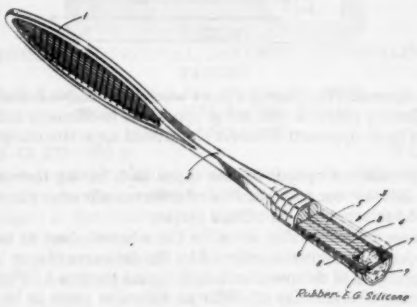
each of said depending fingers adjacent their free ends, said notches arranged for engagement with said strings when positioned therebetween whereby longitudinal movement of said elongated body member causes said pivoted ends of said depending fingers to move transversely of said strings and causes said depending fingers to move to angular positions relative to said elongated body member and means on said elongated body member for detachably engaging at least one of said elongated depending fingers so as to hold it in desired angular relation to said elongated body member.

4,082,273

STRIKING IMPLEMENTS

James M. Ellzey, Narberth, Pa., assignor to The Ellzey Company, Radnor, Pa.

Filed Feb. 19, 1976, Ser. No. 659,384
Int. Cl.² A63B *49/08*
U.S. Cl. 273—73 J **9 Claims**



1. A tennis racket incorporating means for minimizing shock imparted to the arm of a user, comprising:

(a) a head portion,

(b) an elongated handle affixed to said head portion and including a gripping portion near the end thereof remote from said head portion, said handle consisting of a single longitudinal slot therein lying in a plane substantially parallel to that of said head portion, extending part of the length of said handle from the end thereof farthest from said head and laterally through said handle so as to divide said handle into two unitary parts and so as to permit longitudinal movement of said parts relative to each other, and said gripping portion having a longitudinal hole in the distal end thereof remote from said head portion and extending a part of the length of said gripping portion, said hole being of substantially uniform cross section throughout its length, wherein its length is substantially the same as the length of an object inserted therein, and having bounding surfaces substantially free from obstructions so that an object inserted therein is free to move in relation to said surfaces subject only to frictional forces exerted between said surfaces and said object whenever longitudinal movement between said parts of said handle occurs when an object is struck with said racket,

(c) an insert of resilient elastic material contained in said hole, said insert having a dimension transverse to the longitudinal axis of said handle which is somewhat larger than the transverse dimension of said hole prior to insertion thereof, such as to spread the parts of said handle upon insertion, and

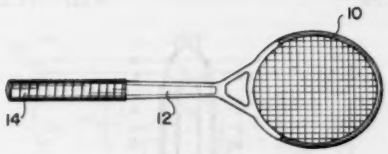
(d) a grip-enhancing binding applied to the exterior of said gripping portion in a manner to urge the parts of said handle toward each other and to compress said insert.

4,082,274

TENNIS RACKET

Robert Stevens, 552 Glorietta Ave., Newport Beach, Calif. 92660

Filed Jun. 22, 1976, Ser. No. 698,523
Int. Cl.² A63B *49/02*
U.S. Cl. 273—73 C **4 Claims**



1. A tennis racket comprising a frame having a loop portion and further having a co-planar integral neck portion at one end of the loop portion and extending radially outwardly from the loop portion and circumscribing an area smaller than the area circumscribed by the loop portion, and a handle comprised of two longitudinal sections formed of metal stampings, the inner ends of the two handle sections each having a configuration corresponding to the configuration of the neck portion and to the sides of the loop portion adjacent to the neck portion, said inner ends extending over the neck portion and over said sides of said loop portion of the frame adjacent to said neck portion to sandwich said neck portion and said sides of of said loop portion of said frame therebetween, said handle sections being adhesively bonded to said neck portion and to said sides of said loop portion of said frame adjacent to said neck portion.

4,082,275

SPORT RACKET

Tsai C. Soong, and Jeanne F. Soong, both of 1839 Jackson Rd., Penfield, N.Y. 14526

Filed Jul. 26, 1976, Ser. No. 708,380
Int. Cl.² A63B *51/06*
U.S. Cl. 273—73 D **10 Claims**

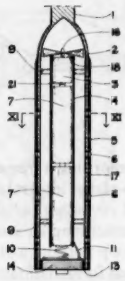
1. A sport racket having an open frame, a handle, and a network of two transversely oriented sets of tension strands joined to said frame to be tensioned across an open region of said frame for hitting a ball, said racket being characterized by the joining of said strand sets of said network to said frame along a curved region to provide said network with two oppositely oriented curvatures along two transverse directions forming a saddle shaped giving each opposite face side of said network both concave and convex curvatures so said tension strands are curved before engagement with said ball.

4,082,276

VENTILATED HANDLE FOR TENNIS RACKETS OR THE LIKE

Marius Szafianski, 230 E. 79th St., Apt. 7C, New York, N.Y. 10021

Filed Jul. 29, 1976, Ser. No. 709,897
Int. Cl.[2] A63B *49/08*
U.S. Cl. 273—75 2 Claims



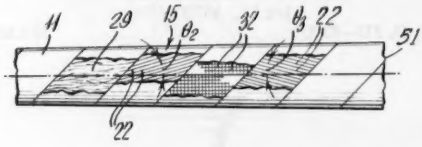
1. A handle for use with a tennis racket or the like requiring physical effort, employing ventilation system integral with said handle, said ventilation system being defined by: energizing means disposed within an interior chamber forming a portion of said handle; an outer covering of said handle defined by a plurality of perforations; said perforations being formed as continuous passages extending from said interior portion to said outer covering and air moving means associated with said energizing means for moving air through and around said perforations at said outer covering.

4,082,277

GOLF CLUB SHAFT

Richard L. Van Auken, Bridgewater, and Allwyn W. Pirtle, S. Plainfield, both of N.J.

Filed Aug. 3, 1976, Ser. No. 711,284
Int. Cl.[2] A63B *53/10*
U.S. Cl. 273—80 R 10 Claims



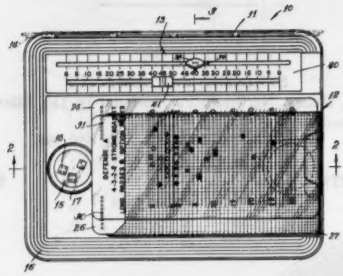
1. A graphite fiber reinforced tubular golf shaft having a tip section, body section and butt section and comprising: at least two superimposed strips of resin impregnated unidirectional continuous graphite fiber reinforcements spirally wound on a hollow metal core, each strip of resin impregnated graphite fiber material being generally quadrangular in shape, each strip disposed in an oppositely angled relationship with respect to the next adjacent strip such that the graphite fibers are oriented with respect to the longitudinal axis of the metal core at angles of $\pm 5°$ to $\pm 15°$; a layer of woven fiberglass cloth interposed between alternating layers of superimposed strips of resin impregnated graphite fiber reinforcement, said woven fiberglass cloth being positioned such that the glass fibers therein are oriented at 0° and 90° with respect to the longitudinal axis of the tubular metal core; a layer of structural metal adhesive interposed between said core and said resin impregnated unidirectional graphite fiber strips, said superimposed resin impregnated graphite fiber strips being molecularly bonded to each other and to the metal core by thermal curing of said resin and adhesive.

4,082,278

GAME DEVICE

Douglas R. Bolton, Palatine, Ill., assignor to Cadaco, Inc., Chicago, Ill.

Filed Oct. 15, 1976, Ser. No. 732,907
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—94 R 14 Claims



1. Apparatus for playing a game wherein defensive action by a defensive player is effected in opposition to offensive action taken by an opponent offensive player, said apparatus comprising:

a plurality of opaque offense sheets each having thereon a different one of a plurality of different offensive plays to be selected by said offense player;

means for removably covering the selected sheet so as to prevent observation thereof by the defensive player;

a plurality of defense sheets each having thereon a different one of a plurality of different defensive plays to be selected by said defensive player; and

means for placing the selected defensive sheet in fixed overlying relationship to said selected offensive sheet with the covering means disposed therebetween, said defensive sheet being light transmissive to permit use of ambient light in the viewing of said offensive sheet through said defensive sheet upon removal of said covering means with said selected sheets mounted in said overlying relationship whereby said selected defensive play may be seen superposed on said selected offensive play for indicating the competitive result of the joint play by said offense and defense players.

4,082,279

PHONEMIC WORD GAME METHOD

Robert L. McFadden, 105 Loller Rd., Hatboro, Pa. 19040

Filed Jun. 17, 1976, Ser. No. 696,867
Int. Cl.[2] A63B *67/06*; G09B *19/22*
U.S. Cl. 273—272 4 Claims

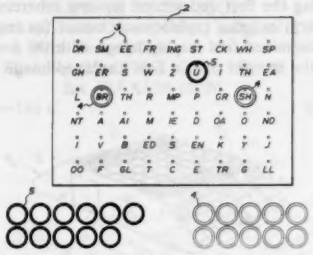
1. A method of manipulating the playing surface of a game board by at least two players, said playing surface having a plurality of game areas, each of said areas being provided with selected phonemic indicia at least a plurality of which are less than word length, said indicia also being combinable agglutinatively with selectable others of said indicia to form words or parts of words larger than the constituent indicia, said board also being provided with means for releasably confining game pieces to respective ones of said areas, said method comprising:

(a) placing by a first player of one of said game pieces on a selected one of said areas for releasable confinement thereto,

(b) then placing by another player, in his turn, of another of said game pieces on a selected other one of said areas for releasable confinement thereto,

continuing, if necessary, the placement of additional game

pieces on respective game areas by the players in turn until the phonemic indicia associated with at least some of said areas on which pieces have been placed constitute the phonemes of an intelligible word, and



(d) thereupon removing by a player all of said placed game pieces and retaining them.

4,082,280

THREE-DIMENSIONAL, LAYERED, SELF SEALING TARGET

Otis C. Lang, R.D. 1, Box 221, Pittston, Pa. 18643

Filed Dec. 3, 1975, Ser. No. 598,044
Int. Cl.² F41J *3/00*
U.S. Cl. 273—102 B **1 Claim**

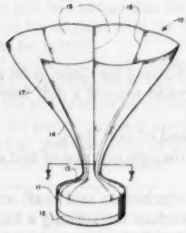
1. A resealable archery target attachable to a bale of hay comprising a paper mache sheet molding constructed and arranged in three-dimensional high relief in the size and shape of an animal; and a plurality of layers of latex rubber applied to said paper mache molding, of sufficient thickness to substantially re-seal an opening formed by an arrow shaft propelled there through, the outermost of said latex layers including concentrated tint coloring emulating the coloring of an animal.

4,082,281

SHUTTLE ARTICLE FOR GAMES

Ping F. Chen, 7445 Plum Blossom Dr., San Jose, Calif. 95129

Filed Jun. 14, 1976, Ser. No. 695,531
Int. Cl.² A63B *67/18*
U.S. Cl. 273—106 A **4 Claims**



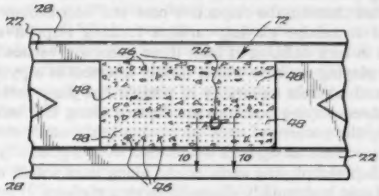
1. A shuttle article for games comprising a base member, said base member comprising a kicking surface for kicking the article into the air; and a cone-shaped chute member flaring outwardly from said base member, said chute member comprising an outer diameter at least twice that of the base member; a plurality of spaced ribs and a plurality of thinly webbed ribbed sections with at least a portion of one of said sections being removed for forming an opening extending from the outer periphery of the chute inwardly toward the base, said opening comprising substantially all of the space between at least one pair of said ribs for improving the turn-around characteristics of the article at its apogee and perigee of flight.

4,082,282

AIR CUSHION GAME

Nicholas D. Trbovich, 28 Tanglewood Dr. West, Orchard Park, N.Y. 14127

Division of Ser. No. 546,719, Feb. 3, 1975, Pat. No. 3,992,009.
This application Aug. 24, 1976, Ser. No. 717,278
Int. Cl.² A63F *7/00*
U.S. Cl. 273—126 R **4 Claims**



1. An air cushioned game comprising in combination:

an air bed means, said air bed means including a powered air source means and holes in at least a portion of the surface thereof, said air source means discharging air upwardly through said holes in the surface of said air bed means, at least one scoring area, said scoring area being adjacent to said air bed and being substantially coplanar therewith so that a playing area is formed by said air bed means and said scoring area,

at least one game piece having a shape, area and weight such that it floats upon at least a portion of said air bed means when said air source means is activated and is capable of moving over at least a portion of said air bed generally without touching it.

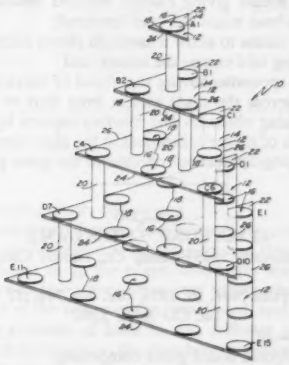
air escape grooves, said air escape grooves being disposed in the surface of said air bed means in communication with said holes therein so that the air cushion supporting said game piece may partially escape in a non-uniform manner when said game piece passes over said escape grooves so that the orientation and movement of said game piece is thereby distorted in an unpredictable manner.

4,082,283

THREE-DIMENSIONAL BOARD GAME

Vivian R. La Ferla, 268 Fruit Hill Ave., N. Providence, R.I. 02910; Janine E. Moreau, 14 Apple Blossom La., Coventry, R.I. 02816, and Mariano Rodrigues, 100 Friendly Rd., Cranston, R.I. 02911

Filed Sep. 7, 1976, Ser. No. 721,178
Int. Cl.² A63F *3/00*
U.S. Cl. 273—241 **9 Claims**



1. A multilevel game board for three-dimensional piece jumping games comprising, a plurality of at least three plates

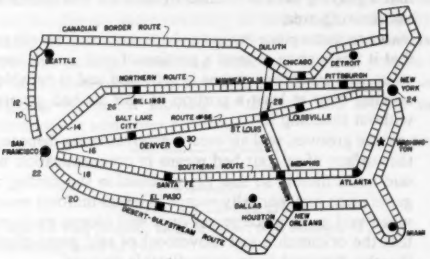
disposed in generally parallel, vertically spaced relationship to each other, each said plate having at least one playing position delineated thereon and forming a generally equiangle triangular, horizontally disposed playing surface having an apex, a base edge opposite thereto and intermediate connecting side edges, the number of playing positions provided on each such successive playing surface progressively decreasing in ascending order in accordance with the number of parallel rows of playing positions extending from the base edge to the apex provided thereon, the respective base and intermediate edges of said successive playing surfaces forming respective edge planes in turn defining at least three generally vertically disposed playing surfaces which further intersect in a pyramidal form and wherein a plurality of straight line jump paths of at least three playing positions are formed along the lines connecting the corners of each successive horizontally disposed playing surface, along lines within each of said generally vertically disposed playing surfaces and along lines within at least one of said horizontally disposed playing surfaces.

4,082,284

BOARD GAME APPARATUS

John N. Jennings, 1312 Anderson Ave., Fort Lee, N.J. 07024

Filed Jan. 8, 1976, Ser. No. 647,650
Int. Cl.[2] A63F *3/04*
U.S. Cl. 273—251 **5 Claims**



1. A game apparatus comprising in combination:

a game board provided with a playing area which simulates the geographical outline of a country and having route indicia extending across the playing area, and indicia for start, finish, cities, traps, and rivers located at strategic positions on the playing area;

two sets of opposing player tokens to be moved along said route indicia;

a die element having numerical indicia showing distance to move one of said player tokens along a selected route;

command means giving chance selected instructions to a player whose token has been captured;

escape die means to allow a captured player token to escape by casting said escape die means; and

said game apparatus having the object of moving all player tokens across the route indicia from start to finish after overcoming obstacles and evading capture by the opposite team of player tokens and at the same time providing useful geographical information to the game participants.

4,082,285

ELECTRONIC CHESS GAME

David B. Bathurst, 19857 Susan Ct., Mount Clemens, Mich. 48043

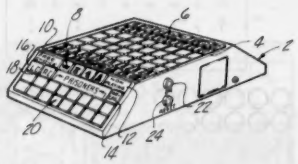
Filed Nov. 15, 1976, Ser. No. 741,787
Int. Cl.[2] A63F *3/02*
U.S. Cl. 273—237 **3 Claims**

1. An electronic board game comprising:

a first playing board surface made up of a number of depressible playing squares;

a first display means for displaying at each of said squares an image of any one of those playing pieces required for the game; and

logic circuitry to permit each player of the game to selectively cause said image to be automatically transferred from a first square to a second square upon sequentially pressing the first and second squares wherein said logic circuitry includes replacement means for replacing the predetermined first display image with the second image after the transfer of said first displayed image to one of a



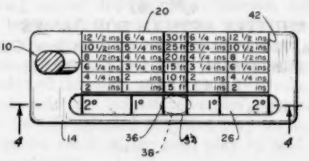
predetermined number of playing squares defining a back row of the playing surface, said replacement means including image decoder means for sensing when said first display image is transferred to one of said predetermined number of squares and wherein said logic circuitry includes indicator means responsive to said image decoder means for indicating when a player is allowed to transfer images from one square to another and when the player is allowed to replace the first predetermined display image with the second image.

4,082,286

DIRECTION AND SLOPE INDICATING PUTTER HEAD

Ferdinand J. La Breche, 412 Burchett St., Glendale, Calif. 91203

Filed Aug. 2, 1976, Ser. No. 710,821
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—162 B **4 Claims**



1. A putter for indicating the slope, level and angle at which a putt should be stroked toward a golf hole comprising:

an elongate shaft;

a handle on one end of said shaft;

an offset head on the opposite end of said elongate shaft from said handle;

said head being attached to said shaft and having a planar perpendicular surface for striking a ball;

an elongate levelling bulb in the uppermost surface of said head;

the axis of said bulb being substantially parallel with said planar surface;

indicating means on said head correlated with said levelling bulb for directly reading the direction toward which a ball should be struck with respect to the hole;

said indicating means comprising a table having a column of distance from the hole increments and a separate column for each respective degree marking; said separate columns having numbers representing the amount of offset from the center of the hole at which to strike the ball for each respective distance from the hole increment,

whereby the amount of offset to the right or left of the hole

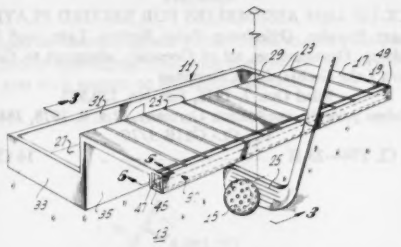
at which to strike the ball may be determined from the position of the bubble in said levelling bulb.

4,082,287

TRAINING APPARATUS FOR IMPROVING A GOLFER'S PUTTING TECHNIQUE

George V. Berkey, Palm Desert, Calif., assignor to Mr. Putt, Incorporated, Palm Desert, Calif.

Filed Sep. 23, 1976, Ser. No. 725,688
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 C 15 Claims



15. For use on a putting surface with a putter and a golf ball, a training apparatus for improving putting, comprising;

a base for placement on the putting surface adjacent the golf ball;

a cantilever extending outwardly from said base over the putting surface, said cantilever being constructed of a transparent material; and

elongated visual guide means carried by said cantilever adjacent the outer edge thereof, said guide means including an upper guide strip and a lower guide strip, said guide strips being of contrasting shades or colors and supported horizontally, one above the other, in spaced vertical relation, said upper guide strip being narrower than said lower guide strip, whereby a golfer can observe said lower guide strip on both sides of said upper guide strip when his eyes are positioned directly thereabove;

said cantilever including a series of reference lines spaced substantially periodically along the entire length thereof, said reference lines being normal to the longitudinal axes of said upper and lower guide strips;

said base, when in use, being oriented on the putting surface so that said upper and lower guide strips are positioned directly over the golf ball and so that the longitudinal axes of said guide strips are aligned with the direction in which the golf ball is to be putted;

said cantilever and said visual guide means being sized and, when in use, being spaced above the putting surface so that the head of the putter must be maintained in relatively close relation to the putting surface throughout a stroke of the golf ball and so that the head of the putter does not bear on any portion of the apparatus.

4,082,288

METHOD OF MAKING ADJUVANT FOR ELASTOMERIC COMPOSITION

Frank Stephen Martin, Cranston; Terence Melvin, North Kingstown, and Joseph Kirby Pieroni, Providence, all of R.I., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 441,716, Feb. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 284,303, Aug. 28, 1972. This application Oct. 22, 1975, Ser. No. 624,685
Int. Cl.[2] A63B *37/00*; C08L *9/00*
U.S. Cl. 273—218 7 Claims

1. A method of making a molding composition comprising (A) performing an adjuvant by slurrying zinc oxide in a volatile liquid medium selected from the group consisting of water and an alkanol, the concentration of zinc oxide in the slurry being from 31 to 65 percent by weight, thereafter rapidly adding to the slurry, while agitating the slurry, methacrylic acid in an amount such as to provide a zinc oxide-methacrylic acid molar ratio of at least 0.8 to 1, the methacrylic acid being added within a 30-second addition time, whereby an exothermic reaction between the zinc oxide and the methacrylic acid takes place, the said liquid medium serving to dissipate the heat liberated by the exothermic reaction, subsequently removing the volatile liquid medium from the resulting reaction product by evaporation to provide a dried product having a moisture content below 0.5% by weight, and grinding the resulting dried product at least to a fineness sufficient to pass a 200 mesh sieve, the resulting product being of white color and having an assay of at least 90% by weight of material in which zinc oxide and methacrylic acid are combined in the proportions required by basic zinc methacrylate, the product having a pH of from 6.0 to 6.25 in a water slurry, and displaying in thermogravimetric analysis a 5% weight loss between 120° and 140° C, an additional 10% loss between 180° and 240° C, and an additional 35% loss between 320° and 430° C, and displaying in differential thermal analysis a pronounced endothermic change peaking at 180° C followed by a smaller endothermic change at 235° C, and (B) thereafter uniformly mixing from 10 to 60 parts by weight of the resulting preformed adjuvant with 100 parts by weight of a free-radical crosslinkable resilient elastomer and a free-radical curing agent for the elastomer in amount sufficient to cure the elastomer.

3. A method of making a molded article comprising preparing a molding composition as in claim 1, and subsequently molding the resulting composition in a desired shape while heating to curing temperature.

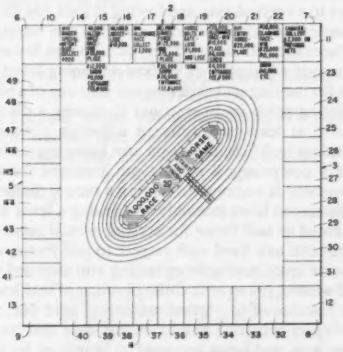
4. A method as in claim 3 in which the said molded article is a solid golf ball, and the said elastomer is cis-polybutadiene having a cis-1,4 content of at least 50%.

4,082,289

HORSERACING GAME

Ronald Merritt, Staten Island, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jun. 14, 1976, Ser. No. 695,747
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—246 1 Claim



1. A horseracing game, comprising

a square gameboard having four edges, four corners, four corner squares marked at the four corners thereof and 36 boxes marked along the edges, nine boxes being marked along each edge between the corner squares thereof and a race track at the center of the gameboard, said race track having a plurality of lanes having different numbers of spaces and the boxes on the gameboard containing indicia controlling the game played on the race track;

a plurality of markers shaped as miniature horses each being of a different color;

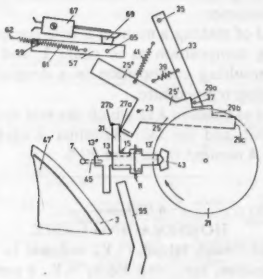
a plurality of chips of the same number and colors as the markers for keeping the places of the players in the boxes on the gameboard;
a plurality of post position cards for indicating different post positions to be assumed by players selecting them;
a plurality of dice of the same number and colors as the markers for determining the progress of the players' horses around the race track;
a pair of throwing dice for determining the movement of the players around the boxes of the gameboard;
a plurality of odds chips;
play money; and
a dice cup.

4,082,290

AUTOMATIC RECORD PLAYER MECHANISM FOR TURNTABLE SPEED AND PICK-UP ARM POSITION ADJUSTMENT

Georg Cukrowski, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 14, 1976, Ser. No. 686,474
Claims priority, application Germany, May 16, 1975, 2521869
Int. Cl.[2] G11B *17/06, 25/04*
U.S. Cl. 274—9 A 3 Claims



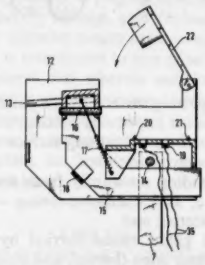
1. An automatic record player mechanism comprising:
a frame,
a shift member mounted to the frame for motion with respect to a vertical axis, and having at least one pick-up arm adjusting surface, a first arm, a second arm having stepped surfaces for defining different pick-up arm lowering positions, and a plurality of vertical adjoining lever steps,
means for moving said shift member into one of a plurality of adjusting positions in response to sensing a diameter of a record, at least two different adjusting positions corresponding to different pick-up arm lowering positions, said means comprising a sensing pin arranged for a vertical movement in response to sensing a record diameter, and a transmission lever assembly comprising a lever and a rider mounted to said frame for coaxial pivotal motion about a horizontal axis fixed with respect to said frame, said transmission lever having an extending arm disposed to engage said sensing pin so as to cause pivoting of said lever assembly responsive to vertical motion of said pin; said rider having an actuating arm extending over said transmission lever arm, and being arranged to be moved by movement of said extending arm from a standby position to a pick-up arm selecting position for engaging a selected vertical adjoining step in response to sensing of record diameter by the sensing pin, said rider arm remaining engaged by said step after the transmission lever has returned to a standby position,
a pick-up arm positioning member,
means for bringing said pick-up arm postioning member into engagement with a pick-up arm adjusting surface when said shift member is in an adjusting position so as to define a pick-up arm lowering position,
a single-arm dead-center lever pivotally mounted to the frame, having a free end arranged to be engageable with said first arm in a position to one side of dead center while said shift lever is in a first of said adjusting positions, and movable to a position to the other side of dead center in response to movement of said shift lever from said first to a second of said adjusting positions,
an over-center spring connected to said dead-center lever to urge the lever away from dead center, and
means for setting a turntable speed responsive directly to said dead-center lever position.

4,082,291

PICK-UP ARM ASSEMBLIES FOR RECORD PLAYERS

Gerhart Metzler, Offenburg; Peter Rother, Lahr, and Hans Sukopp, Orsenhausen, all of Germany, assignors to Gerätewerk Lahr GmbH, Lahr, Germany

Filed Oct. 7, 1976, Ser. No. 730,582
Claims priority, application Germany, Oct. 8, 1975, 2545159
Int. Cl.[2] G11B *3/10*
U.S. Cl. 274—23 R 14 Claims



1. A pick-up arm assembly for a record player, said assembly comprising:
a pick-up arm comprising a pick-up arm tube, a sound pick-up mounting means disposed at one end of said tube, and an insert fitting means disposed at the other end of said tube;
supporting means for supporting said pick-up arm including means for removably mounting said insert fitting means, said supporting means further comprising horizontal pivot means defining a horizontal axis and vertical pivot means defining a vertical axis;
a pick-up arm counterweight supported by said supporting means and, said supporting means including means for shiftably mounting said counterweight in a plane substantially parallel with respect to said horizontal pivot means; and,
adjusting means provided on said insert fitting means for horizontally shifting said counterweight into a position wherein said pick-up arm can be balanced within said supporting means.

4,082,292

TONE ARM LIFT MECHANISM

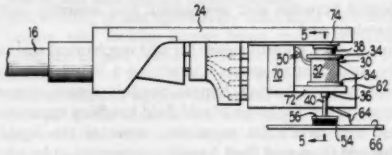
Donald K. Fletchic, Arlington Heights; Howard J. Morrison, Deerfield, both of Ill., and Ralph H. Baer, Manchester, N.H., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 4, 1976, Ser. No. 738,695
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—23 R 35 Claims

1. A tone arm lift mechanism for a phonograph device having a turntable for supporting a record and a tone arm mounted for movement of one end over the record surface, comprising:
a selectively actuatable solenoid coil mounted on the tone arm including a solenoid armature movable with respect to the coil and oriented in position for movement gener-

ally perpendicular to the surface of a record disposed on the phonograph device;

resilient means mounted adjacent one end of said armature for engagement with the surface of said record; and



means for energizing said solenoid coil to move the resilient means into engagement with said record and lift the tone arm with respect to the record surface.

4,082,293

PHONOGRAPH RECORD PLAYER OR CHANGER

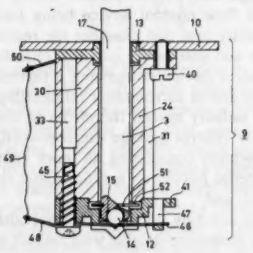
Jozef E. K. M. Schouwenaars, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1976, Ser. No. 715,139

Claims priority, application Netherlands, Aug. 29, 1975, 7510210

Int. Cl.² G11B *3/60*

U.S. Cl. 274—39 A **2 Claims**



1. A turntable drive and bearing mechanism for a phonograph record player having low wow and flutter, comprising a frame; a lower, thrust bearing mounted to the frame, and an upper sleeve bearing remote from said lower bearing and mounted to the frame; a turntable spindle having a longitudinal axis, a coaxial circular cylinder portion engaging said upper sleeve bearing, and a lower end engaging said thrust bearing; a turntable mounted on said spindle for rotation therewith about said axis, said upper bearing being between said thrust bearing and said turntable; and drive means for rotating said turntable about said axis;

wherein said drive means exerts a transverse force on the spindle; and said upper sleeve bearing has two contact regions, and surrounds said circular cylindrical portion with radial play such that bearing contact engagement with said cylindrical portion occurs at said two contact regions only, said upper bearing having a generally circular cylindrical bore, with said contact regions lying in a plane transverse to the spindle axis and extending inwardly toward the center of the bore at angularly separated locations about said spindle and so arranged that a resultant force of all transverse forces acting on the spindle has a radial angular direction between said two locations.

4,082,294

CLEANING AND STATIC-REMOVING DEVICE FOR GRAMOPHONE RECORDS

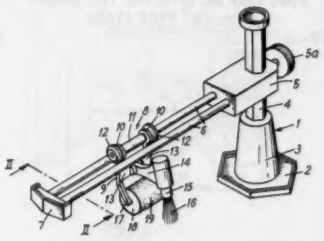
Mark Stanley Myers, London, and Richard George Bowler, Bengeo, both of England, assignors to Metrosound Audio Products Ltd., England

Filed Oct. 18, 1976, Ser. No. 733,534

Claims priority, application United Kingdom, Mar. 31, 1976, 12959/76

Int. Cl.² G11B *3/58*

U.S. Cl. 274—47 **3 Claims**



1. A device, for cleaning and removal of static electricity from a gramophone record when the record is on a record playing apparatus having a turntable rotatable with respect to a deck, comprising, in combination:

(i) a mounting post for standing or securing on the deck in a position radially beyond the edge of the turntable, said mounting post including a substantially vertical elongated stem having a longitudinal axis,

(ii) a carrier having an aperture receiving said stem, the carrier being slidable along the stem,

(iii) a pair of substantially horizontal guide rods carried by and projecting from the carrier in parallel spaced relationship normal to the axis of the stem,

(iv) a slider having a body portion which includes two upward extensions which are apertured to receive a rod on either end of which slider bearings are mounted,

(v) a cleaning element for the record grooves and an element for removal of static electricity from the record both, carried on said slider.

4,082,295

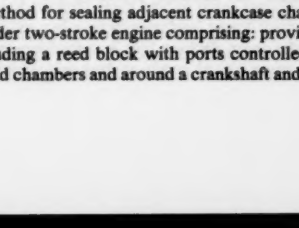
REED VALVE WITH CRANKSHAFT SEAL AND METHOD

Dean R. Bainard, Bethel Township, County of York, S.C., assignor to Garlock Inc., Rochester, N.Y.

Filed May 25, 1977, Ser. No. 800,196

Int. Cl.² F02B *75/20*

U.S. Cl. 277—1 **17 Claims**



14. A method for sealing adjacent crankcase chambers of a multi-cylinder two-stroke engine comprising: providing a reed valve, including a reed block with ports controlled by reeds, between said chambers and around a crankshaft and sealing the

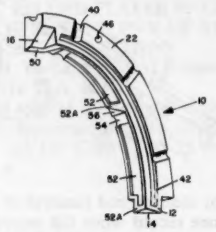
crankshaft passing through said reed block by securing a metal insert, having an elastomeric shaft sealing lip bonded to the I.D. thereof, to said reed block between said block and reeds, and positioning said sealing lip in sealing contact with the crank-shaft.

4,082,296

SEAL FOR SEALING BETWEEN A ROTATING MEMBER AND A HOUSING

Philip C. Stein, Stein Seal Company 20th St. & Indiana Ave., Philadelphia, Pa. 19132

Filed May 26, 1976, Ser. No. 690,069
Int. Cl.[2] F16J 15/16
U.S. Cl. 277—3 **12 Claims**



1. In a rubbing seal for sealing between a rotatable member and a housing containing a fluid and having (1) a seal ring mounted for movement towards and away from the rotatable member and having a sealing face with a circumferential sealing portion sealing against the rotatable member, (2) means to bias said sealing face of the seal ring towards the rotatable member, and (3) means to limit the rotation of the seal, the improvement comprising:

a plurality of circumferential sections of the sealing face upstream of the circumferential sealing portion confronting the rotatable member, the leading portion of each of said sections with respect to the direction of relative rotation being spaced closer to the rotatable member than is the remaining portion of the section and the regions in the sealing face immediately preceding and following each section being in unrestricted communication with the interior of the housing and further removed from the rotatable member than the remaining portion of the section, to produce a negative hydrodynamic lift urging the seal ring towards the rotatable member due to the fluid flow induced by the rotation of the rotatable member.

4,082,297

BYPASS FLUSH SYSTEM EMPLOYING THERMAL BUSHING

William V. Adams, Pavilion Township, Kalamazoo County, Mich., assignor to Durametallic Corporation, Kalamazoo, Mich.

Filed Feb. 9, 1977, Ser. No. 767,169
Int. Cl.[2] F16J 15/16
U.S. Cl. 277—15 **9 Claims**

1. In combination, comprising:

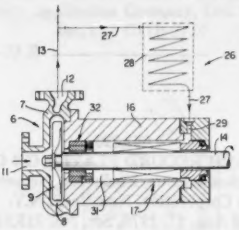
a fluid handling apparatus having housing means defining therein a fluid receiving chamber, rotatable shaft means projecting into said chamber, and fluid contacting means movably disposed within said chamber and mounted on said shaft means for rotation therewith;

a sleevelike housing structure disposed in surrounding relationship to said shaft means and fixedly connected to said housing means;

a mechanical seal assembly coacting between said shaft means and said housing structure, said mechanical seal assembly including a first annular seal member surrounding and nonrotatably connected to said shaft means and a second annular seal member surrounding said shaft means and nonrotatably mounted relative to said housing structure, said first and second annular seal members having opposed seal faces maintained in slidable sealing engagement with one another, said housing structure and said shaft means defining therebetween a seal cavity which is located between said mechanical seal assembly and said chamber; and

environmental control means for said mechanical seal assembly, said control means comprising a liquid type bypass flush system having bypass conduit means connected between the discharge of said fluid handling apparatus and said seal cavity for permitting some of the liquid discharged from said fluid handling apparatus to be supplied into said seal cavity, the improvement wherein said bypass flush system includes,

air-cooled heat exchanger means associated with said bypass



conduit means for cooling the liquid which flows therethrough.

a flow control device for permitting substantially continuous flow through said bypass conduit means into said seal cavity, said flow control device being located between said seal cavity and said chamber for restricting flow of liquid from said seal cavity into said chamber,

said flow control device comprising a thermal bushing assembly disposed in surrounding relationship to said shaft means and radially spaced therefrom to define a narrow annular flow control passage therebetween, said thermal bushing assembly comprising an inner annular sleeve of carbon material having an annular metal retainer shrunk therearound, and

holding means coacting with said thermal bushing assembly for holding same nonrotatable with respect to said housing structure.

4,082,298

INFLATABLE PACKER AND VALVE MECHANISM THEREFOR

Lawrence Sanford, 4047 Hollister, Houston, Tex. 77055

Filed Nov. 19, 1975, Ser. No. 633,404
Int. Cl.[2] F16J 15/46
U.S. Cl. 277—34.3 **14 Claims**

1. An inflatable packer comprising:

a. a first tubular member having generally radial port means therethrough;

b. a second tubular member slidably telescopically mounted on said first tubular member, a first annular space being formed between said tubular members and in communication with said port means;

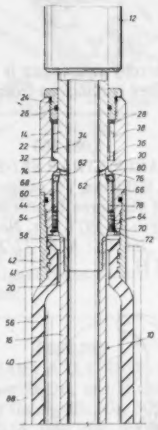
c. an inflatable packer element carried by said second tubular member, said first tubular member extending through said packer element, a second annular space being formed between said first tubular member and said packer element;

d. a valve means disposed in said first annular space, said valve means comprising

i. annular seal means operative upon the presence of a pressure differential decreasing across said seal means toward said second annular space to permit fluid flow

through said first annular space from said port means to said second annular space and inflate said packer element, and further operative upon the presence of a pressure differential decreasing across said seal means toward said port means to form a seal between said port means and said second annular space,

ii. and locking means operatively associated with said seal means, said locking means being operative upon the presence of said pressure differential decreasing across said seal means toward said port means to lock said first tubular member against movement with respect to said second tubular member in a first longitudinal direction, and releasable upon the application of a force to said first tubular member in said first longitudinal direction to permit relative longitudinal movement of said first



tubular member in said first direction to thereby break said seal and deflate said packer element;

e. wherein each of said tubular members has a respective annular shoulder within said first annular space, said shoulders facing at least partially axially and in generally opposite directions, and said tubular members having a first relative position in which said shoulders are generally opposed; wherein said locking means comprises an annular expanding spring disposed axially of said seal means; and wherein said seal means is axially movable toward said spring upon the presence of said pressure differential decreasing across said seal means toward said port means when said tubular members are in said first position to force said spring between said shoulders and into engagement with each of said shoulders.

4,082,299

SEALING MEANS AND ASSEMBLY THEREFORE

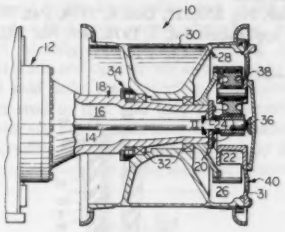
William Porter Sly, and Reginald Karl Ringel, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 3, 1975, Ser. No. 627,981
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—82 **9 Claims**

1. A differential-final drive arrangement for a vehicle, said arrangement comprising an axle extending from a differential to a first housing and out a hole therein removed from said differential; first abutment means on said first housing; a final drive within a second housing having gear means driven by spline means on said axle, said second housing being rotatably supported by said first housing; second abutment means on said gear means; and a wheel integral with said second housing and rotated by said gear means, a slidable seal between a first compartment defined by said differential and said first housing and a second compartment defined by said second housing, said slidable seal comprising:

(1) a sleeve thrust bearing about said axle within said second housing having a first end thereof in slidable sealing abutting relation with a respective one of said first abutment means and said second abutment means and a second end extending towards a respective other of said first abutment means and sand second abutment means;

(2) a sleeve thrust member about said axle within said second housing having a first end abutting said respective other of said first abutment means and said second abutment means and a second end fitting within said second end of said bearing;



(3) resilient toroidal sealing means compressed between said axle and said bearing, said second end of said member extending within said second end of said bearing sufficiently to contact said toroidal sealing means on sufficient compression of said spring means; and

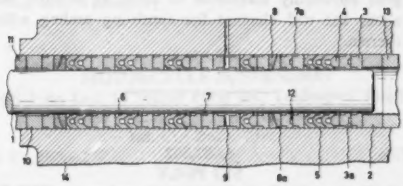
(4) compression means biasing said bearing axially away from said member, said slidable seal maintaining a first oil level in said differential, said first oil level being lower than a second oil level maintained by said slidable seal in said second housing.

4,082,300

PACKING FOR STUFFING BOXES OF PISTON PUMPS WITH METAL PLUNGER

Alfred Harbeck, Kriftel, Taunus; Dieter Rebhan, Hofheim, Taunus, and Richard Walburg, Schwalbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 21, 1976, Ser. No. 734,608
Claims priority, application Germany, Oct. 23, 1975, 2547415
Int. Cl.[2] F16J *15/06*
U.S. Cl. 277—123 **4 Claims**



1. A packing for stuffing boxes of piston pumps including a metal plunger and pump cylinder, receiving said plunger, in a pump case, said packing being mounted in said pump case for receiving said plunger and including a stationary mounting ring, detention rings adjacent said mounting ring, said detention rings having inner and outer circumferential surfaces each having recesses formed therein, supporting rings having plane and double-conical bearing surfaces, with the plane surface of one of said supporting rings engaging one of said mounting rings, V-shaped packing rings having inner and outer circumferential surfaces and a circumferential recess formed on their inner surfaces, with one of said packing rings receiving the double-conical bearing surface of one of said supporting rings,

double-conical rings, a lubricating ring, and a distance ring assembled in said pump case to form a seal against said plunger.

4,082,301

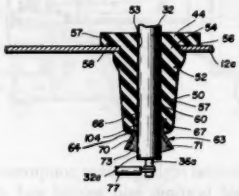
MOUNTING GROMMET FOR AN ELECTRIC HEATING ELEMENT USED IN APPLIANCES AND THE LIKE

Fred G. Salinger, Baltimore, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Division of Ser. No. 530,321, Dec. 6, 1974, Pat. No. 3,997,760. This application Jul. 6, 1976, Ser. No. 702,815

Int. Cl.[2] F16J *15/06*

U.S. Cl. 277—212 F **3 Claims**



1. A mounting grommet for mounting a rod element through an aperture in a bulkhead of predetermined thickness, comprising:

a resilient body portion of a size to be forcibly urged through the aperture;

a neck portion formed integral with said resilient body portion and having an axial extent greater than the predetermined thickness of the bulkhead to receive the bulkhead, said neck portion being of a width to substantially fill the aperture formed in the bulkhead;

a head portion formed integral with said neck portion to overlie the periphery of the aperture within the bulkhead of the side opposite said resilient body portion, a passage being formed axially through said resilient body portion, said neck portion and said head portion to receive the rod element therethrough; and

seal means including a rigid annular member having a first portion inserted into said passage in said resilient body portion and a second portion generally conical in configuration extending axially of said body portion and divergent outwardly therefrom to form an annular trough about the rod element for receiving sealing adhesive therein.

4,082,302

SKI POLE

Alfred Albrecht, Riedholz, Switzerland, assignor to BFG Baumgartner Freres SA, Grenchen, Switzerland

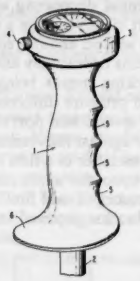
Filed Oct. 1, 1976, Ser. No. 728,536

Claims priority, application Switzerland, Oct. 7, 1975, 12987/75

Int. Cl.[2] A63C *11/22*

U.S. Cl. 280—11.37 H **2 Claims**

1. A ski pole comprising a pole having a handle on the upper end thereof, the end of said handle which is opposite the end connected to said pole being free, a chronometer enclosed within a casing including a front wall having an opening for exposing the face of the chronometer and a back wall that is engagable with the free end of said handle, and bayonet locking means releasably securing said chronometer casing back wall to the free end of said handle and including a bayonet fitting protruding longitudinally from said handle and a cooperative bayonet fitting recessed in the back wall of said chronometer casing, whereby said casing is devoid of protrusions when the chronometer is removed from said handle.



4,082,303

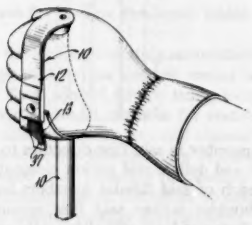
RELEASABLE-STRAP SKI-POLE GRIP

Robert J. Finnegan, Williston, Vt., assignor to Barreca Products Co., Subsidiary of Shelburne Industries, Inc., Shelburne, Vt.

Filed Feb. 2, 1977, Ser. No. 764,848

Int. Cl.[2] A63C *11/22*

U.S. Cl. 280—11.37 H **9 Claims**



1. A releasable-strap ski-pole grip, comprising a single injection-molded piece of flexibly yieldable material having an upstanding hand-grip body portion and upper and lower strap portions integral with said body portion, said body portion having an elongate bore for assembly to the upper end of a ski pole, said strap portions respectively extending in substantially the same radial offsetting direction from the upper and lower ends of said body portion, and said strap portions also extending longitudinally toward each other and to discrete adjacent ends, said strap portions having inner and outer relatively broad faces which are radially spaced from each other and with respect to the bore axis; and hook-and-loop releasably engageable tape-fastener means including a first tape element secured to the inner face of one of said strap portions near the longitudinally projecting end thereof, and a second tape element secured to the outer face of the other strap portion near the longitudinally projecting end thereof.

4,082,304

SKI-SLED

Carl M. Kendrena, 701 W. Windsor Ave., Phoenix, Ariz. 85007

Filed Jan. 24, 1977, Ser. No. 761,530

Int. Cl.[2] B62B *13/10*

U.S. Cl. 280—12 KL **5 Claims**

1. A ski-sled mechanism comprising:

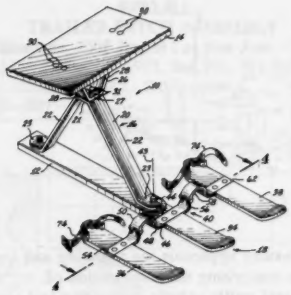
a. an elongated ski-like main runner;

b. a seat positioned above said main runner;

c. support means extending between said main runner and said seat for interconnection thereof;

d. a ski-like guide runner having its rearmost end pivotally connected to the forward end of said main runner for pivotal movement about a pivot axis which is perpendicular to said main runner;

e. a pair of ski-like outrigger runners each laterally spaced from a different opposite side of said guide runner and parallel therewith; and



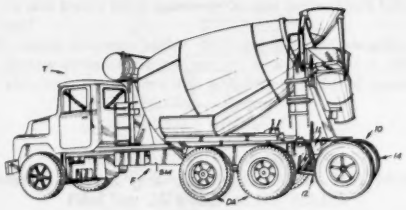
f. hinge means for rigidly interconnecting said pair of outrigger runners with said guide runner for pivotal movement therewith and for hingedly interconnecting said outrigger runners and said guide runner to allow independent movements of said outrigger runners about the longitudinal axis of said guide runner.

4,082,305

AUXILIARY AXLE ASSEMBLY

Blaine H. Allison, Charles Dr., and Richard F. Allison, Oak Harbor Cir., both of Gainesville, Ga. 30501

Filed Jul. 14, 1976, Ser. No. 705,146
Int. Cl.² B60G *17/00*
U.S. Cl. 280—81 R **16 Claims**



1. An auxiliary axle assembly for a wheeled vehicle having a vehicle frame and movable along its longitudinal axis comprising:

an auxiliary support frame assembly for connection to the vehicle frame;

a pair of spaced apart torque arms pivotally mounted on said support frame assembly about a common pivot axis generally normal to the longitudinal axis of the vehicle, each of said torque arms including an extending end movable in a generally vertical plane as said torque arms pivot about said common pivot axis, each of said torque arms, including a threaded stud at the extending end thereof,

a wheel and axle assembly including an axle, and a pair of wheel and tire assemblies rotatably mounted at opposite ends of said axle;

a pair of axle seat assemblies, one of said axle seat assemblies mounted on each of said torque arms for movement therewith as said torque arms pivot about said common axis, said wheel and axle assembly mounted by said pair of axle seat assemblies so that said axle is generally perpendicular to the longitudinal axis of the vehicle, each of said axle seat assemblies including a support tube slidably receivable on one of said pair of torque arms for axial movement along said torque arm and an alignment connector operatively associated with said support tube;

positioning means for selectively rotationally and resiliently positioning said torque arms about said common pivot axis; and,

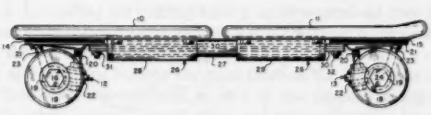
alignment adjustment means positively interconnecting each of said axle seat assemblies with said torque arm carrying said axle seat assembly for selectively positioning said axle seat assembly axially along said torque arm and longitudinally of the vehicle to adjust the orientation of said axle with respect to the longitudinal axis of the vehicle, said alignment adjustment means including an internally threaded member threadedly engaging one of said threaded studs and operatively connected to said support tube of said axle seat assembly associated with said threaded stud so that said axle seat assembly is moved along with and held by said internally threaded member as said internally threaded member is axially moved along said threaded stud when said threaded member is rotated.

4,082,306

TORSION BAR SKATEBOARD

Gregg Sheldon, 330 Sunnyside Rd., Temple Terrace, Fla. 33617

Filed Dec. 9, 1976, Ser. No. 749,022
Int. Cl.² A63C *1/28*
U.S. Cl. 280—87.04 A **7 Claims**



1. An improved skateboard comprising:

a. a platform means having a forward portion and a separate, spaced rear portion suitably constructed for operably mounting of,

b. a front wheel assembly secured to said forward portion,

c. a rear wheel assembly spaced from said front wheel assembly secured to said rear portion, and

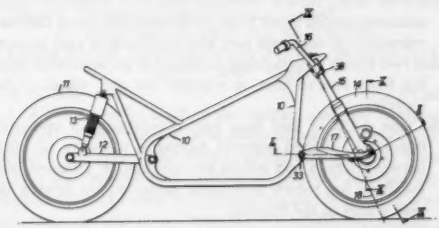
d. an elongated torsion bar mounted underneath said platform means secured to said front wheel assembly, projecting underneath said platform means and secured to said rear wheel assembly said torsion bar twisting throughout its length thereby providing for relatively different tilting movements between said front wheel assembly and said rear wheel assembly.

4,082,307

MOTORCYCLE SUSPENSION

Robert John Tait, 15 Manor Farm Rd., Tredington, England

Filed Dec. 8, 1975, Ser. No. 638,328
Int. Cl.² B62K *25/06*
U.S. Cl. 280—277 **6 Claims**



1. A suspension and steering assembly for the steered wheel of a motorcycle, comprising a raked telescopic fork assembly,

a pivotal connection between one end of the fork assembly and a frame of the motorcycle permitting relative rotational movement between the fork assembly and the frame about an axis normal to the plane of the frame and about an axis contained in that plane, handlebars rigidly attached to the fork assembly, a non-rotary wheel hub member secured to the other end of the fork assembly, a wheel rotationally mounted on the wheel hub member, a radius arm assembly pivoted to the frame below the pivotal connection between the fork assembly and the frame, and pivotal connection between the radius arm assembly and the hub member at a location rearwardly spaced from the axis of rotation of the wheel, the pivotal connection between the fork assembly and the frame and the pivotal connection between the radius arm assembly and the hub member together defining a steering axis which passes through said pivotal connections and passes rearwardly of the axis of rotation of the wheel.

4,082,308

BICYCLE-TRAINING APPARATUS

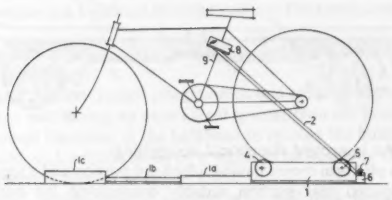
Josef H. Hug, 2 Ziefeldstrasse, Olten, Switzerland (CH-4600)

Filed Jan. 3, 1977, Ser. No. 756,440

Claims priority, application Switzerland, Jan. 19, 1976, 684/76

Int. Cl.² B62H *1/04*; A63B *69/16*

U.S. Cl. 280—296 **1 Claim**



1. A bicycle-training attachment for a bicycle comprising:

a disassemblable frame having a base which can be driven by the rear wheel of the bicycle, said base having a base part, side walls and two releasable support arms extending from said base part which is attached by clamping to the frame of the bicycle;

each support arm comprising a horizontal support arm which extends horizontally and protrudes perpendicularly from the base part, an oblique support arm extending obliquely upwards situated at the free end of the respective horizontal support arm, and clamping means between the oblique support arms so that the frame part of the bicycle can be clamped;

a square-sectioned socket for mounting of the horizontal support arms on the base part laterally thereof so that the horizontal support arms are inserted into the socket and said clamping means, including clamping screws for restraining of the horizontal support arms in said socket;

said base being further provided with two moveable roller elements spaced apart from each other and being fastened releasably to said base part and the frame of said bicycle;

said two rotary rollers being arranged at an adjustable spacing from one another to support the rear wheel of the bicycle;

the side walls of said base part comprising an upwardly opening U-shaped support having a plurality of bores between which said rollers are mounted at different bore locations for rotary movement imparted by driving the rear wheel of the bicycle;

an adjustable guide tube which is arranged on the base part, said guide tube being adjustable in length in telescopic fashion and carrying, at its end, a guide member for the front wheel of the bicycle.

4,082,309

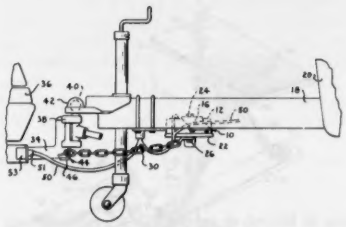
ANTI-SWAY APPARATUS FOR TRAILERS

James E. Fox, 721 N. Wells, Gary, Ind. 46403

Filed Feb. 4, 1977, Ser. No. 765,786

Int. Cl.² B60D *7/00*

U.S. Cl. 280—446 B **5 Claims**



1. An anti-sway apparatus for a towing and trailer vehicle combination comprising the combination of:

means on said trailer vehicle connecting said towing vehicle for braking the sway of said trailer vehicle;

means in a side of said trailer vehicle for sensing change in air pressure against said side of said trailer vehicle;

electric circuit means energized by said means in said side of said trailer vehicle, said energized electric circuit means actuating said means on said trailer vehicle to brake the sway of said trailer vehicle.

4,082,310

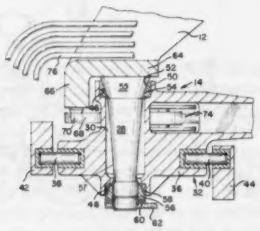
LOW PROFILE VEHICLE HITCH

Dale Wyatt Hawk, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Nov. 26, 1976, Ser. No. 745,084

Int. Cl.² B60D *1/00*

U.S. Cl. 280—492 **6 Claims**



1. An apparatus for connecting tractor and trailer units or similar articulated vehicles which enables limited lateral tilting and horizontal angling of the units relative to each other about horizontal and vertical axes, said apparatus comprising

means forming an elongate horizontal pivot member mounted in spaced bearing members for lateral tilting movement, said spaced bearing members being supported on a rear frame portion of said tractor unit,

said bearing members being arranged to provide a horizontal pivot axis constituting an axis of rotation for said pivot member forming means which extends at a low level relative to said rear frame portion of said tractor unit,

said pivot member forming means having a socket formation extending in a vertical plane through the axis of rotation of said means,

a vertical pivot pin secured in depending fixed relation on a member on said trailer unit which extends forwardly of said trailer unit and which is positioned in overlying relation to said rear frame portion of said tractor unit,

said vertically disposed pivot pin having a base portion of

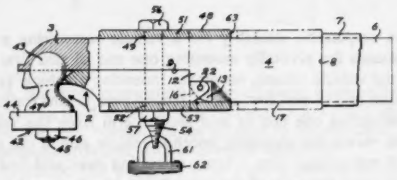
relatively short axial extent secured in depending relation on said forward portion of said trailer unit and a shaft forming portion of substantially greater axial extent seated in rotatable relation in said socket formation, and

said pivot pin and said socket formation being arranged so as to support said pivot pin and to provide for rotation of said pivot pin on a vertical pivot axis.

4,082,311
TRAILER HITCH ASSEMBLY

Willdoune Hamman, 2305 Bambi La., San Jose, Calif. 95116

Filed Mar. 28, 1977, Ser. No. 781,726
Int. Cl.² B60D 1/06
U.S. Cl. 280—507 **6 Claims**



1. A trailer hitch assembly for a vehicle adapted to be towed by a towing vehicle or tractor equipped with a ball coupling unit, the combination comprising:

(a) a bar member adapted to be attached to the tongue of a vehicle to be towed and constituting an extension thereof, said bar member including a central body portion and a forwardly projecting reduced-in-thickness connector plate portion including a semi-spherical recess therein;

(b) a lock plate pivotally mounted on said bar member and including a bifurcated forward end portion proportioned to cooperate with the ball unit of a coupling assembly to lock the trailer hitch assembly to said ball unit;

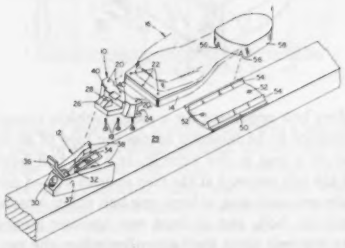
(c) a sleeve slidably disposed on said bar member and movable between a forward locking position and a rear unlocking position in which said lock plate is free to pivot in relation to said bar member, thereby enabling engagement of said trailer hitch assembly on said trailer hitch ball unit; and

(d) means interengageable with said sleeve, forwardly projecting connector plate portion and lock plate to detachably lock the trailer hitch assembly in a closed condition.

4,082,312
CROSS COUNTRY SKI BINDING

Lennart B. Johnson, Federal Hill Rd., Milford, N.H. 03055

Filed Sep. 21, 1976, Ser. No. 725,173
Int. Cl.² A63C 9/10
U.S. Cl. 280—615 **3 Claims**



1. A cross country ski binding comprising

a toe unit adapted to be attached to the toe of a ski boot to extend longitudinally forwardly thereof and

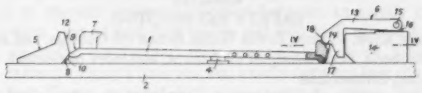
a ski unit adapted to be attached to the upper surface of a ski, said toe unit and said ski unit carrying mating stop surfaces cooperating by surface abutment to prevent any longitudinal and transverse relative movement when one of said stop surfaces is moved longitudinally relative to the other and said surfaces are locked together, and

said toe unit and said ski unit carrying engageably cooperating locking means a portion of said locking means being movable generally perpendicularly to the longitudinal axis of said ski to lock together said stop surfaces, the rearward portion of said ski unit cooperating with the forward portion of said toe unit to transversely center said ski with forward movement of said toe unit.

4,082,313
SAFETY SKI BINDING

Jean Joseph Alfred Beyl, Boulevard Victor-Hugo, Nevers, Nièvre, France

Filed Apr. 5, 1976, Ser. No. 673,720
Claims priority, application France, Apr. 11, 1975, 75 11336
Int. Cl.² A63C 9/08
U.S. Cl. 280—618 **4 Claims**



1. In a safety ski binding having an elongated ski boot support plate rotatably mounted on a pivot adapted to be secured to the ski, and having binding means at the front and rear ends of said plate for holding the boot thereon, the combination of a fixed abutment mounted on said ski and adapted to engageably retain one end of said plate, and resilient retaining means mounted on said ski registering with the opposite end of said plate for maintaining said plate in its normal operative position while permitting movement of the plate away from the ski, said resilient retaining means comprising

a pintle mounted perpendicularly on said ski adjacent to but spaced from the opposite end of said plate,

a locking arm tiltably mounted on the upper end said pintle and at one end normally engaging the said opposite end of said plate for retaining said plate on said ski,

means forming a cam surface mounted on said ski adjacent the other end of said locking arm and

a spring-loaded piston projecting from the other end of said locking arm and engaging said cam surface,

said cam surface having two different contours being shaped to impart to said plate through the one end of said locking arm release forces of different values against both lateral rotational movement and upward pivotal movement of said locking arm.

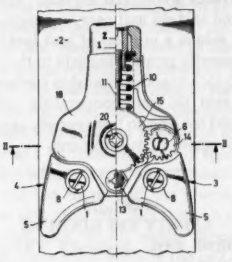
4,082,314
FRONT JAW FOR SAFETY SKI BINDINGS

Gerhard Sedlmair, Farchant, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany

Filed Mar. 18, 1977, Ser. No. 778,970
Claims priority, application Germany, Mar. 19, 1976, 2611743
Int. Cl.² A63C 9/08
U.S. Cl. 280—625 **2 Claims**

1. A front jaw for a safety ski binding, said jaw comprising two levers which are pivotable about respective vertical pivots and have free ends in the form of holders for retaining the sole of a ski boot against outwardly and upwardly directed movement, and spring means for influencing said levers to a normal position, each said pivot being itself rotatably but axially immovably mounted on a jaw portion that is fixed with respect to the ski and being provided with a screw-thread engaging in a tapped hole of the respective lever, characterised in that identi-

cal pinions are secured to the upper ends of the pivots, said pinions being in mesh with an intermediate gear which is

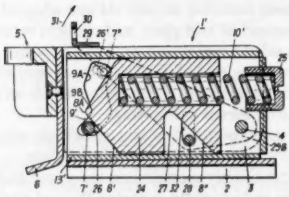


mounted on a jaw portion that is fixed with respect to the ski and which is rotatable by manual means.

4,082,315
SAFETY SKI BINDING

Erwin Krob, Vienna; Erwin Weigl, Brunn am Gebirge, and Josef Svoboda, Schwechat, all of Austria, assignors to Gertsch AG, Zug, Switzerland

Division of Ser. No. 591,032, Jun. 27, 1975, Pat. No. 4,025,087. This application Feb. 22, 1977, Ser. No. 770,452
Claims priority, application Austria, Jul. 26, 1974, 6181/74
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—631 **6 Claims**



1. A safety ski binding, comprising:

a base;

a sole holder pivotally connected to said base and movable about a pivot axis between a position of use and a release position, said pivot axis extending transversely to the longitudinal direction of a ski;

adjustable abutment means mounted on said base;

a holding element fixedly mounted on said base;

a slide member reciprocally slidably movably mounted on said base and having inclined surface means thereon, said slide member being movable toward and away from said holding element;

resilient means consisting of a single spring engaging and extending between said slide member and said adjustable abutment means for urging said slide member toward the holding element on said base;

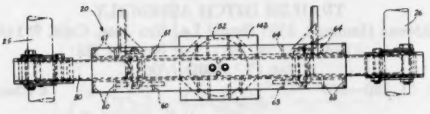
means defining a threshold part; and

transversely extending locking pin means received in longitudinally extending slot means in said sole holder and positioned to engage said holding element and said inclined surface means at a location spaced from said threshold part when said sole holder is in said position of use, a movement of said sole holding part toward said release position effecting a movement of said locking pin means past said threshold part against the urging of said single spring resisting the separation movement between said holding element and said inclined surface means on said slide member.

4,082,316
MULTIPLE AXLE SUSPENSION WITH LOAD EQUALIZER BEAM

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Division of Ser. No. 555,393, Mar. 5, 1975. This application May 17, 1976, Ser. No. 687,228
Int. Cl.[2] B60G *5/04*
U.S. Cl. 280—681 **15 Claims**

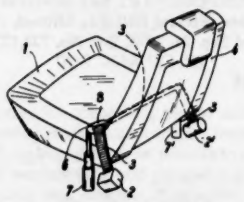


1. A suspension assembly for a vehicle comprising a first arm, means for pivotally mounting one end of said first arm from the vehicle chassis, means for mounting a vehicle axle at the other end of said first arm, a second arm, means for pivotally mounting one end of said second arm from the vehicle chassis, means for mounting another vehicle axle at the other end of said second arm, a beam extending over said first and second arms, the ends of the beam being attached to the arms at an intermediate location between the chassis mount points and the axles, one end of the beam being attached for movement with one of said arms, and the other end of the beam being attached for movement with the other of said arms, and resilient means mounted above the beam and between the beam and vehicle chassis and between the beam and said arms and attaching the beam to the vehicle chassis and the arms to resiliently support the axle load.

4,082,317
SAFETY BELT FOR MOTOR VEHICLES

Per-Olof Weman, Heverlee, Belgium, assignor to Sigmatex AG Basel, Basel, Switzerland

Division of Ser. No. 685,954, May 13, 1976, which is a division of Ser. No. 550,098, Feb. 14, 1975, Pat. No. 3,977,701, which is a division of Ser. No. 316,953, Dec. 20, 1972, Pat. No. 3,887,212. This application May 27, 1977, Ser. No. 801,445
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—745 **1 Claim**

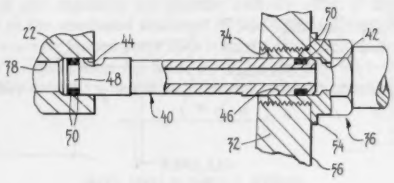


1. A safety belt apparatus for a motor vehicle comprising: a hip belt adapted to be fastened across the hips of an occupant positioned on a seat in the vehicle, said hip belt having two ends, said hip belt secured at the two ends to a fixed part of the vehicle adjacent said seat, at least one belt roller attached to an end of said hip belt, and at least one traction means which unrolls the hip belt from the belt roller when the car door is opened and releases the belt so that it can be rolled up by the belt roller to bear tightly on the body of the occupant when he is seated in a seat of the vehicle; and wherein said traction means is a telescopic tube mounted on the fixed part of the vehicle and having an extensible end slidably connected to said hip belt.

4,082,318
HYDRAULIC CONNECTION AND METHOD

Otto Mueller, Jr., Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Aug. 10, 1976, Ser. No. 713,180
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—19 8 Claims



3. A hydraulic connection for establishing a connection for transmitting fluid under pressure between a hydraulic unit and a fluid line, said connection comprising in combination:

a housing provided with a threaded aperture;

a hydraulic unit provided with a port, said hydraulic unit being fixed within said housing, and said hydraulic unit being provided with a first recess having a cylindrical surface disposed about said port and in generally concentric alignment with said threaded aperture;

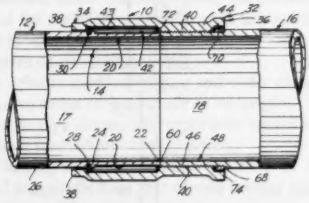
a fluid line terminating in a fitting, one end of which is threaded into said threaded aperture, and said one end being provided with a second recess having a cylindrical surface; and

a standpipe one end of which is received within the first recess in fluid tight relationship with the cylindrical surface of said first recess and the other end of which is received within the second recess in fluid tight relationship with the cylindrical surface of the second recess.

4,082,319
COUPLING SLEEVE

Sidney Berger, Great Neck; Salvatore Buda, East Hills, and Burton Weintraub, Old Bethpage, all of N.Y., assignors to Berger Industries, Inc., Maspeth, N.Y.

Filed Jul. 6, 1976, Ser. No. 703,101
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.[2] F16L *19/02*
U.S. Cl. 285—27 6 Claims



1. A coupling sleeve for joining a first and a second conduit section, each of said conduit sections having two ends and a length equal to at least four times its external diameter, and having circular cylindrical outer wall surfaces with an axial passage of constant cross-sectional dimensions and configurations, one end of each of said conduit sections having a flat substantially perpendicular end face and external thread means thereon and the other end of each of said conduit sections being non-threaded and having a flat substantially perpendicular end face and a length of reduced outside diameter extending axially inwardly from said flat substantially perpendicular end face at said other end of said conduit section to form a stop shoulder in said outer wall surface at said non-threaded end, and a lock ring means positioned in a lock ring groove located in said outer wall surface near and spaced axially inwardly from said stop shoulder, said lock ring means in its normal unbiased condition projecting in part above said outer wall surface, said coupling sleeve comprising:

(a) a body having an axially inward end with an end face and an axially outward end with an end face;

(b) a first radially inwardly extending flange at said axially inward end;

(c) a second radially inwardly extending flange adjacent said axially outward end, said second flange having female thread means thereon;

(d) said first flange defining a central opening of a diameter slightly greater than the diameter of said outer wall surface;

(e) said second flange defining a central opening smaller than the diameter of said outer wall surface, but slightly greater than the diameter of said length of reduced outside diameter, said central openings being in axial alignment so that said coupling sleeve may be slipped onto said other non-threaded end of said first conduit section;

(f) an axial clearance formed between said first and second flanges having an axially extending wall; and

(g) an annular undercut disposed between an axially outward face of said first flange and said wall of said axial clearance constructed and arranged to receive foreign material trapped between said axially outward face of said first flange and said lock ring means to ensure proper cooperation of said outward face with said lock ring means,

(h) at least one of said lock ring means and a cooperating surface of said first flange having camming means to constrict said lock ring means into said annular lock ring groove when said coupling sleeve is moved axially inwardly on said non-threaded end of said first conduit section;

(i) said axial clearance receiving said lock ring means when it returns to its normal unbiased position as said first flange clears said lock ring means;

(j) said axially outward face of said first flange adapted to cooperate with said lock ring means to prevent said lock ring means from being forced radially inwardly entirely into said lock ring groove so that said coupling sleeve is prevented from being pulled axially outwardly from said other non-threaded end of said first conduit section as said coupling sleeve is threaded onto said one externally threaded end of said second conduit section so as to force said end faces of said first and second conduit sections together;

(k) said length of reduced outside diameter extending axially inwardly at least the width of said second flange so that said coupling sleeve may be backed off said externally threaded end of said second conduit section after said first and second conduit sections are assembled whereby said second flange will abut said stop shoulder and said end face of said coupling sleeve will be at least flush with said flat substantially perpendicular end face of said first conduit section to permit said first conduit section to be laterally displaced from said second conduit section without longitudinal movement of either conduit section.

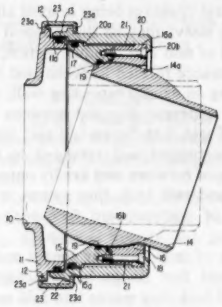
4,082,320
PIPE COUPLING

Karl Weinhold, Im Jagdfeld 43, D-4040 Neuss, Germany

Filed Oct. 28, 1976, Ser. No. 736,587
Claims priority, application Germany, Nov. 3, 1975, 2548978
Int. Cl.[2] F16L *27/06*
U.S. Cl. 285—31 14 Claims

1. In a pipe coupling for connecting together the ends of two pipes and composed of coupling components associated with respective pipe ends, the coupling components including two outwardly projecting annular collars each associated with a respective pipe end, a housing member associated with and

forming a sealed connection with one of the pipe ends, a plug-in member associated with and forming a sealed connection with the other pipe end and arranged to be inserted in the housing member, and a first sealing ring disposed to provide a sealing connection between the members when the plug-in member is inserted in the housing member, the coupling further including a quick release lock composed of a plurality of partial clamps each having a pair of spaced, radially inwardly directed flanges arranged to fit around the annular collars to hold the coupling in its assembled condition with the plug-in member inserted into the housing member, the improvement wherein: said coupling components associated with one of said members include two ring elements located within said one member and formed to present an inwardly directed bearing surface having the form of a spherical segment, each said ring element presenting a portion of said bearing surface, with the



bearing surface portions being spaced apart in the axial direction of said coupling, and means detachably connecting said ring elements together; said pipe end associated with one of said members is formed to present an outwardly directed bearing surface having the form of a spherical segment corresponding to that of, and in close contact with, the inwardly directed bearing surface; and said housing member is constructed to be axially displaceable relative to said one of the pipe ends in the direction away from said plug-in member and to prevent axial movement of said one of the pipe ends relative to said housing member in the direction away from said plug-in member, whereby axial displacement of said housing member away from said plug-in member enables said one of the pipe ends to be displaced laterally relative to said other pipe end without requiring axial displacement of said pipe ends relative to one another.

4,082,321

SEPARATION-PREVENTING PIPE JOINT CONSTRUCTION

Toshi Nakajima; Takao Sagara, both of Amagasaki, and Shohachiro Hagio, Nishinomiya, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

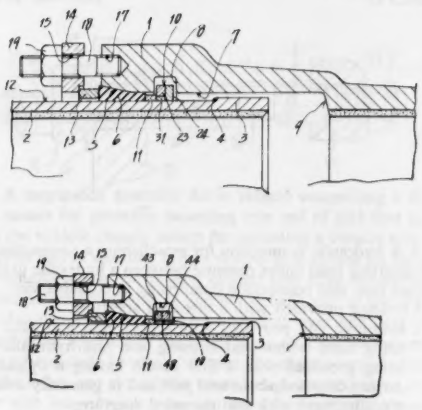
Filed May 14, 1976, Ser. No. 686,546

Claims priority, application Japan, May 16, 1975, 50/59087; Mar. 16, 1976, 51/28775; Mar. 16, 1976, 51/28776; Mar. 16, 1976, 51/28777

Int. Cl.[2] F16L *35/00*

U.S. Cl. 285—39 **10 Claims**

1. In a separation-preventing joint between the plug of one pipe and the socket of another pipe, including sealing means defined by a packing pressed between the plug and socket, and slip-off preventing means comprising a split lock ring fitted in an annular groove defined by wall means in the inner surface of the socket and engageable with a step surface formed on the front end surface of the plug, the plug and socket having radial clearance therebetween; the improvement wherein the opposite ends of said split lock ring are provided with overlap portions adapted to overlap each other axially of the pipes, at least one of said overlap portions being formed on a connection piece separate from said split lock ring, means attaching said connection piece to one end of said split lock ring for adjustment circumferentially of said split lock ring, and retaining means insertable through the radial clearance between said



socket and plug into engagement with said overlap portions for maintaining said lock ring in said groove and in contracted fitted relation with said plug so that said lock ring will abut said wall means and step surface upon attempted separation of the joint.

4,082,322

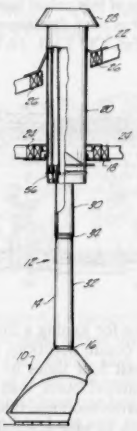
CHIMNEY CONSTRUCTION FOR HEATING FIXTURES

Paul H. Lever, Fallbrook, Calif., assignor to Fireplace Corporation of America, Walled Lake, Mich.

Filed Sep. 11, 1975, Ser. No. 612,273

Int. Cl.[2] F16L *39/00*; F24B *1/18*

U.S. Cl. 285—133 R **4 Claims**



1. A coupling for joining metallic circular chimney sections comprising an integral body of thin-gage sheet metal, formed to have first and second circular coaxial end segments joined by a radial step, the first end segment being shaped with an external hem formed by a reversely looped outer end portion sized to receive and engage the inside end of a first adjoining circular metallic chimney section thereover, the second end

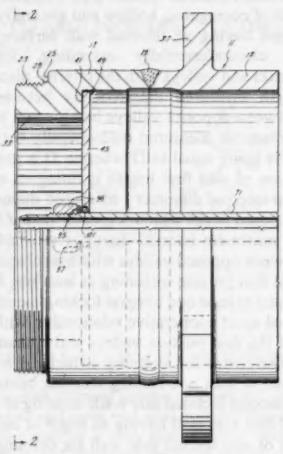
segment being shaped with an internal hem formed by a reversely looped outer end portion sized to receive and engage the outside end of a second adjoining circular metallic chimney section therein, the first end segment extending radially inwardly of the step whereby said external hem on said first end segment is radially offset with said internal hem on said second segment a distance equal to the thickness of said chimney section mating with said first end segment, and said first and second end segments are thereby radially offset a distance equal to the combined thickness of said chimney section and said reversely looped outer ends whereby said step also providing a common stop for axial travel of the first and second chimney sections when in engagement with the coupling.

4,082,323

BOX HOLE DRILL STEEL

Edgar Wray Wood, and Jerry Olympus Young, both of Midland, Tex., assignors to Smith International, Inc., Midland, Tex.

Filed Sep. 9, 1976, Ser. No. 721,828
Int. Cl.² F16L *39/00*
U.S. Cl. 285—133 A **6 Claims**



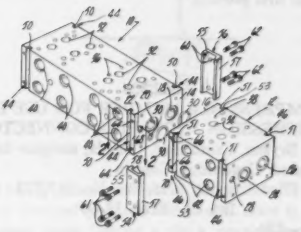
1. Dual tube box drill steel comprising:
an outer tubular metal member having connection means at each end for making connection with like steel;
said outer tubular member having a wall thickness of at least ten percent of its inner radius,
said outer tubular member having and outer circumference of the same order of magnitude as its length,
an inner metal pipe having telescopic joint means at each end for making connection with like steel,
said pipe having an outer diameter which is of a different order of magnitude than that of said tubular member, the pipe being smaller, and
support means positioning said pipe with its length extending lengthwise of the outer tubular member and with the midpoint of the pipe within said outer tubular member, said support means tending to prevent relative axial motion of the pipe and said tubular member,
said support means including elastomeric means tending to position the pipe radially relative to said tubular member to be coaxial therewith but allowing radial movement of the pipe relative to the outer tubular member to compensate for misalignment of the pipe's telescopic joint means with the telescopic joint means on the pipes of adjacent lengths of steel when the latter are made up with the first said steel.

4,082,324

CONNECTION ARRANGEMENT FOR MANIFOLD BLOCKS

Robert E. Obrecht, 805 Stephenson Hwy., Royal Oak, Mich. 48067

Filed Oct. 4, 1976, Ser. No. 729,193
Int. Cl.² F16L *39/00*
U.S. Cl. 285—137 R **8 Claims**



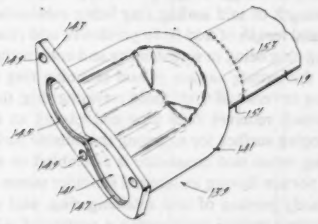
5. A stacked manifold assembly comprising: a first and second manifold block, each manifold block generally rectangular in section and having abutting end faces each formed with port openings formed therein aligned with respect to each other; a pair of elongated slots formed in said manifold blocks on a side surface adjacent said end faces, each of said slots having a sloping side wall surface extending transversely to the plane of said abutting end surfaces and extending towards said end surface; a pair of clamping elements one each engaging respective slot pairs juxtaposed to each other with said manifold blocks positioned with said end surfaces in abutting relationship with each other.

4,082,325

COUPLING DEVICE FOR CONNECTING A PLURALITY OF PORTS TO ONE PIPE

James R. Laundy, Racine, Wis., assignor to Tenneco Inc., Racine, Wis.

Filed May 5, 1976, Ser. No. 683,560
Int. Cl.² F16L *41/00*
U.S. Cl. 285—155 **7 Claims**



1. A fluid flow coupling device for connecting a pair of ports in a manifold or the like to a single port comprising a body having a longitudinal axis and open at opposite ends to provide first and second open ends for the flow of fluid into one of said open ends and out of the other of said open ends, an attachment plate affixed to the body at the first end and adapted to be attached to said manifold and having an opening means therein in alignment with said pair of ports so that said body is in fluid flow communication with said ports, said body being formed of a single piece of drawn sheet metal and characterized by the absence of one or more longitudinally extending joints therein and having a first portion extending longitudinally from said first end over a substantial length of the body and a second portion extending longitudinally from said first portion over the remaining length of the body to said second end, said first

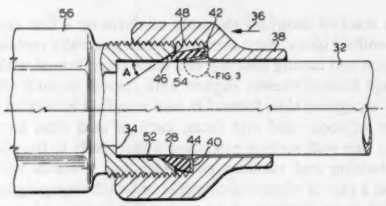
end and said first portion of the body being shaped to have a cross section that is substantially a FIG. 8 in configuration with the loop portions of the 8 spaced apart to be in substantial alignment respectively with said pair of ports, the second end of the body being substantially circular in cross section, the second portion of said body gradually changing in cross sectional shape from said circular second end to a substantially oval cross section and then merging into the FIG. 8 cross section of the first portion.

4,082,326

COMPRESSIBLE MEMBER FOR USE IN COMPRESSION JOINT PIPE CONNECTOR

Cecil Walsh Bryson, Cambridge, Canada, assignor to Canadian Brass Limited, Cambridge, Canada

Filed Aug. 30, 1976, Ser. No. 717,772
Int. Cl.² F16L *33/00*
U.S. Cl. 285—238 **6 Claims**



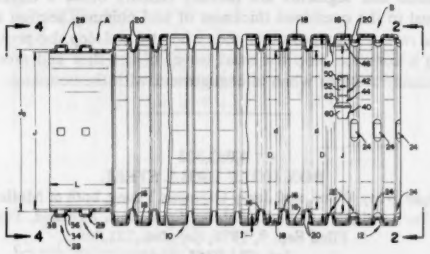
1. In a re-useable compression type pipe connector having threaded male and female portions, one of which receives a pipe end; a sealing and pipe retaining means comprising a retaining ring consisting of a resilient material and having a hollow, truncated cone shaped body portion with a plurality of circumferentially spaced apart slits which extend in an axial direction inwardly from the smaller end of said retaining ring into the body portion thereof to define a plurality of resilient gripping teeth, each having a free end, and a sealing ring consisting of an elastomeric material and having a tubular shape; said gripping teeth being disposed at a low angle relative to the pipe surface, said angle ranging from approximately 5° to 30°; the axial length of said sealing ring being substantially longer than the axial length of said body portion of said retaining ring; said sealing ring being in surrounding and contracting relationship with the outside surface of said retaining ring where said sealing ring covers said slits in said retaining ring; the threaded portion which receives such pipe end having an annular inwardly sloping surface for engaging the outside surface of said sealing ring when said connector is assembled on a pipe end, the other portion having an internal shoulder means for engaging said body portion of said retaining ring, said annular inwardly sloping surface overlapping a portion of said gripping teeth so that as said male and female portions are threadably engaged to thereby move said internal shoulder towards said annular inwardly sloping surface, said annular inwardly sloping surface engages the outside surface of said sealing ring and causes an annular portion of said sealing ring to exert an inwardly directed force on said gripping teeth therebeneath to move them into contact with a pipe surface and simultaneoųsly the annular portion of said sealing ring beyond said gripping teeth is moved into sealing arrangement with such pipe; each gripping tooth free end having a circumferential length to provide substantially more than point contact with a pipe surface, the arrangement of said connector being such that said gripping teeth free ends are precluded from substantially marring a pipe surface when said teeth are in contact therewith whereby the connector is re-useable to form a fluid tight seal around a pipe end previously engaged by said connector.

4,082,327

CONNECTING JOINT FOR CORRUGATED PLASTIC TUBING

Donald W. Sting, and Denis P. Ott, both of Findlay, Ohio, assignors to Hancor, Inc., Findley, Ohio

Filed Aug. 20, 1976, Ser. No. 716,104
Int. Cl.² F16L *21/00*
U.S. Cl. 285—401 **11 Claims**



1. A joint construction for plastic pipe comprising:

a first length of corrugated, hollow and generally cylindrical plastic pipe having an internal wall surface defined by adjacent circumferentially extending, longitudinally spaced peaks and valleys with the internal diameter of said first length measured diametrically between opposite peaks between opposite valleys being equal to *d* and the internal diameter measured diametrically between opposite valleys being equal to D wherein D is greater than *d*;

a first portion of said first length defining an end therefor having an internal diameter *j* measured diametrically between opposed peaks which is greater than *d* but less than D and a maximum internal diameter measured diametrically between opposed valleys which is substantially equal to D, said first portion including at least one integral stop member and at least one integral locking member disposed in a spaced apart cooperative relationship with each other in one of the first portion valleys and extending radially inward therefrom for defining a locking area therebetween, said at least one locking member being defined by first and second inclined side walls meeting at an apex area with said first side wall having an angle of inclination less than that of said second side wall for defining a cam surface and with said second side wall defining a lock surface which comprises one side of said locking area, said first portion further including a plurality of sets of longitudinally aligned grooves formed in at least the peaks spaced from said one valley toward the outer free end of said first portion in a non-aligned relationship with said locking area;

a second length of hollow plastic pipe having a generally cylindrical corrugated portion and a smooth walled cylindrical second portion which defines an end of said second length and has an outer diameter which is slightly less than j;

at least two sets of cleat members extending outwardly from the outer surface of said second length second portion with sets axially disposed from each other therealong, said cleat members having a configuration and location to permit them to move longitudinally into the aligned grooves in the first length first portion so that a portion of said second length is received in said first length first portion with the cleat members of one set being located in said one valley and the cleat members of the other set being located in another valley of the first length first portion; and,

said cleat members and said at least one locking member being relatively dimensioned from said second length second portion and said first length first portion respectively such that there is an interface relationship therebe-

tween as said first and second lengths are rotated relative to each other after said second length second portion has been received in said first length first portion, at least one of said locking and cleat members being resiliently deformable as the associated of said cleat members engages said locking member cam surface to permit said associated cleat member to be passed into said locking area during further forced rotation between said first and second lengths until said associated cleat member is lockingly received in said locking area between said at least one stop member and said locking member lock surface, the incline of said lock surface then preventing rotation between said first and second lengths in the opposite direction unless a rotational force greater than the rotational force required to move said associated cleat member over said cam surface and into said locking area is applied thereto.

4,082,328

APPARATUS FOR JOINING UNDRAWN YARNS

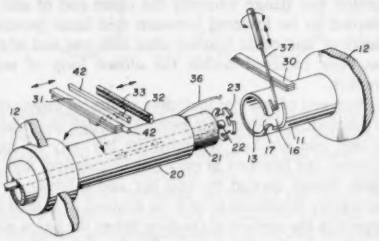
Peter Geoffrey Williams, Mitcheldean, England, assignor to Monsanto Company, Decatur, Ala.

Filed Jul. 28, 1977, Ser. No. 819,792

Claims priority, application United Kingdom, Aug. 6, 1976, 32869/76

Int. Cl.[2] A01D *59/04;* **D03J** *1/18;* **D04G** *5/00*

U.S. Cl. 289—2 **6 Claims**



1. Apparatus for tying a knot in a pair of filaments, comprising:

a. a hollow first element having an open end and an opening adjacent to said open end, said opening being connected to said open end by a slot, said opening being larger in a circumferential direction than the slot so that a filament lying over the opening under tension will extend further into the hollow element than will a filament lying over the slot,

b. a second element having a projecting portion for engaging the ends of a pair of filaments and wrapping said ends around the first element, said first and second elements being movable relative to each other,

c. means adjacent to the first and second element for clamping and holding the ends of the pair of filaments in position to be engaged by said projection and wound around the first element, and

d. hook means movably mounted on the second element for engaging that portion of the filaments lying across the opening and pulling said portions out of the hollow element to form a knot in the filaments.

4,082,329

PRIVACY LATCH FOR FOLDING AND SLIDING DOORS

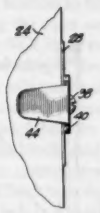
Richard K. Haines, 2317 W. Lexington, Elkhart, Ind. 46514

Filed Sep. 30, 1976, Ser. No. 728,235

Int. Cl.[2] E05C *3/32*

U.S. Cl. 292—202 **4 Claims**

1. A latch for sliding and folding doors comprising a pair of latch plates mounted in confronting relation on a door jamb and a door respectively, one of said plates having an opening, an actuator pivoted to and in face contact with said first named plate adjacent said opening and including a portion overlying said opening in one pivoted position, said plate being clear of said opening in a second pivoted position, the other plate having a latching projection fitting in the opening of said first named plate when said door is closed and said actuator is in a pivoted position clear of said first plate opening, said latching



projection being undercut to receive a portion of said actuator in said first pivoted position when said door is closed, said second named plate having a thick portion and a reduced thickness portion, said reduced thickness portion receiving said actuator to accommodate contact of said first plate with the thick portion of said second plate when said door is closed.

4,082,330

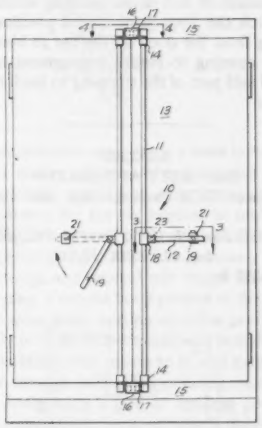
DOOR LOCK VERSION

Delmer L. McWhorter, 929 Drever St., West Sacramento, Calif. 95691

Filed Oct. 8, 1976, Ser. No. 730,940

Int. Cl.[2] E05C *9/08*

U.S. Cl. 292—218 **1 Claim**



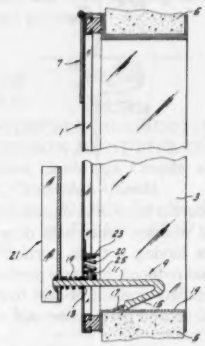
1. A door lock for locking two doors together at their surface of tangency comprising, a pair of vertically extending bars each fastened to one door near their surfaces of tangency, said bars having orthogonally disposed hasps, a pair of hasp hooks disposed between said poles at the top and bottom on a door frame surrounding said doors having a U-shaped configuration to receive and retain said hasps, a pair of arms each substantially medially fastened on each of said poles and pivotable about said poles to engage and disengage said hasps from said hasp hooks by rotating said poles, plural lock means on said doors to receive said arms and lock said arms to said doors so that said hasps are engaged with said hasp hooks and the doors cannot be opened.

4,082,331

DOOR FOR A MINE STOPPING

John M. Kennedy, and William R. Kennedy, both of P.O. Box 38, Taylorville, Ill. 62568

Filed Nov. 4, 1976, Ser. No. 738,690
Int. Cl.[2] E05C 5/00
U.S. Cl. 292—228 8 Claims



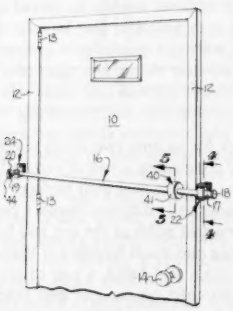
1. A door for closing a doorway in a mine stopping, said door having hinge means at an edge thereof for hingedly mounting the door to swing on an axis adjacent an edge of the doorway between a closed position engaging a face of the stopping all around the doorway and an open position swung away from the doorway, a latch for latching the door closed, said latch comprising a bar extending through an opening in the door adjacent an edge of the door from the outside toward the inside of the door and adapted to extend into the doorway, said bar having a detent portion adjacent its inner end, said bar being movable inwardly and outwardly in said opening and being swingable in said opening about an axis transverse to the bar for engagement of said detent portion behind part of the stopping to latch the door in its closed position, and spring means reacting from the door on the bar to bias the bar outwardly in the opening to ensure engagement of said detent portion behind said part of the stopping to latch the door in its closed position.

4,082,332

SECURITY APPARATUS

Wayne D. Palmer, 5622 Faulconbridge Rd., Charlotte, N.C. 28212

Filed Jan. 27, 1977, Ser. No. 762,855
Int. Cl.[2] E05C 19/00
U.S. Cl. 292—259 R 7 Claims



1. A security apparatus for overlying a door or the like to prevent the opening thereof by intruders, and characterized by the ability to minimize damage to the door and resist the release of the apparatus upon a forceable battering of the door against the apparatus, and comprising

an elongate rigid bar having a length sufficient to extend transversely across and beyond the door opening,

a pair of brackets, with each bracket having means for mounting the same to the wall along the side of the door opening, and means for selectively securing the bar to such bracket when the brackets are mounted on opposite sides of the door opening such that the bar may be selectively mounted to extend between the brackets and across the door opening,

one of said brackets being in the form of a substantially closed loop of generally rectangular cross-sectional outline and comprising an inner portion adapted to be positioned against a supporting wall surface and an outer portion which is parallel to and spaced from said inner portion,

the other of said brackets having a generally J-shaped cross-sectional outline and comprising an inner portion adapted to be positioned against a supporting wall suface and an outer flange which is parallel to and spaced from said inner portion,

said means for securing the bar to said one bracket comprising the spacing between said inner and outer portions whereby one end of the bar is adapted to be received therebetween and said means for securing the bar to said other bracket comprising the spacing between said inner portion and flange whereby the other end of said bar is adapted to be lowered between said inner portion and flange of said other bracket after said one end of the bar has been received within the closed loop of said one bracket,

said other end of said bar including abutment means of a size to preclude the same from passing through the closed loop of said one bracket, whereby the bar may be mounted between the brackets in only one orientation, and

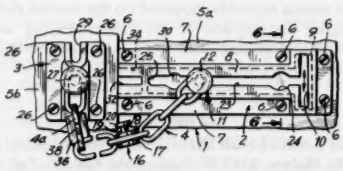
resilient means carried by said bar and extending radially outwardly therefrom so as to be adapted to at least closely approach the surface of the door when the bar is mounted between the brackets, and whereby the resilient means serves to cushion the shock of the door being forceably opened against the bar to thereby minimize damage to the door and reduce the possibility of said bracket mounting means being released upon the forceable battering of the door against the bar.

4,082,333

COMBINATION OF INTERLOCKING SECURITY ON CHAIN DOOR

Bernard C. Segal, 150-6 J. Dreiser Loop, Bronx, N.Y. 10475

Filed Apr. 27, 1976, Ser. No. 680,968
The portion of the term of this patent subsequent to Jul. 15, 1992, has been disclaimed.
Int. Cl.[2] E05C 19/00
U.S. Cl. 292—264 1 Claim



1. A chain door guard assembly for attachment to a mating door and door jamb comprising, in combination,

a bracket for attachment to the door jamb,

a chain rotatably attached to said bracket

a guard plate for attachment to the door, said guard plate having a raised main body section containing a horizon-

tally disposed elongated main slot, a first entry slot providing entry to said main slot near the end thereof adjacent to said jamb and a second entry to said main slot, and an open ended vertical slot extending above and below said main slot at the end of said main slot remote from said door jamb said main slot opens into said vertical slot, whereby a passageway is provided between said horizontal and vertical slots,

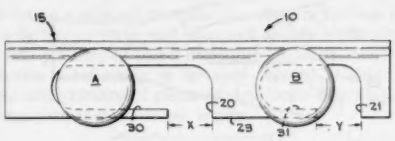
a first chain head fixed to the end of said chain remote from said bracket, said first chain head adapted to be received by said second entry slot and being retained in either said main slot on said vertical slot, and a second chain head fixed to said chain between said first chain head and said bracket, said second chain head being adaptable to be used with or without said first chain head.

4,082,334

INTERIOR SECURITY DEVICE FOR DOUBLE DOORS

Victor S. Volta, 10214 Portal Ave., Cupertino, Calif. 95014, and Joe E. Martin, 379 Howard Dr., Santa Clara, Calif. 95051

Filed Jun. 22, 1977, Ser. No. 808,723
Int. Cl.² E05C *19/18*
U.S. Cl. 292—288 **14 Claims**



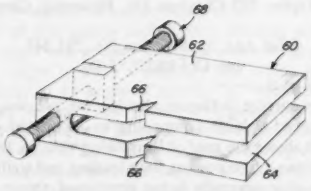
1. In combination, a security device and double doors, said double doors having adjacent door knobs, said security device comprising a rigid plate with an upper wall and lower wall and having a longitudinal direction and a transverse direction, longitudinally spaced openings formed in the lower wall of said plate to receive respectively the narrow portions of adjacent door knobs, and longitudinally spaced and longitudinally extending slots formed in said plate intermediate the upper and lower walls thereof communicating respectively with said openings formed in said plate for locating therein simultaneously the narrow portions of said adjacent door knobs, the transverse dimension of said slots being greater than the narrow portions of the respective door knobs, and lesser than the enlarged portions of the respective door knobs to prevent the opening movement of said double doors when the narrow portions of said knobs are respectively received by said slots.

4,082,335

PORTABLE DOOR SECURING DEVICE

Homer H. Smith, 90 Arden Park, Detroit, Mich. 48202

Filed Feb. 4, 1977, Ser. No. 766,051
Int. Cl.² E05C *19/18*
U.S. Cl. 292—291 **5 Claims**



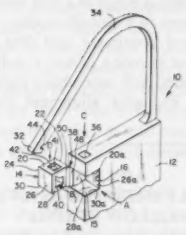
1. A portable door securing device comprising a rigid bridging member adapted to bridge the juncture between the swinging edge of a door and a door frame to prevent swinging movement of the door toward an open position, and a latch bolt adjustably secured to said member and adapted to extend between the swinging edge of the door and the door jamb, said latch bolt including a lateral extension on the end thereof adapted to be received within a recess in the door jamb defined by a keeper plate, means adjustably interconnecting the latch bolt and rigid member to enable the rigid member to be moved toward the door and door frame, and abutment means on said rigid member in opposed relation to the lateral extension on the latch bolt for maintaining the rigid member generally perpendicular to the latch bolt, said rigid member including a rigid block, said latch bolt including a threaded portion extending transversely of the block, said means adjustably connecting the latch bolt to the block including a hand manipulable nut on the threaded portion of the latch bolt for adjusting the latch bolt toward and away from the block, said block including a transversely extending groove communicating with a flat surface thereof for receiving said latch bolt thus enabling separation of the block from the latch bolt in a rapid manner in the event or emergency.

4,082,336

TAMPER PROOF SEAL

Ephraim Natkins, Jackson Heights, N.Y., assignor to American Casting & Mfg. Corporation, Plainview, N.Y.

Filed Nov. 10, 1976, Ser. No. 742,053
Int. Cl.² B65D *33/34*
U.S. Cl. 292—318 **2 Claims**



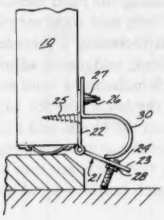
1. A seal construction comprising a main body portion comprising socket means, a tie member comprising an engaging member comprising edges extending from said main body portion, a shaftway for the tie member in said body portion with an opening in said main body portion offset to said shaftway communicating with said socket means, said shaftway continuing through and beyond said socket means and ending as a blind opening, a second body portion in the form of a plug hinged to the main body portion at a first position outside of said main body portion socket means and movable to a second position within said socket means to fit said main body portion socket means through said offset opening, said second body portion plug comprising a pair of resilient protuberances in spaced facing relationship between which the engaging member is positionable, said hinged portion being along a surface of the main body portion and at least one wall of the second body portion plug to form at least a portion of at least one wall of the main body portion when said plug is in second position, said main body portion and said second body portion being formed from a material which has the property of being deformable at the hinged portion which connects said main body portion and said second body portion, said engaging member edges of said tie member and said protuberances of said plug being formed to cooperate to complete a coupling when said second body portion plug is fitted in said socket means and said tie member is positioned through said shaftway for said tie member, and said plug and said tie member being fitted with close tolerance.

4,082,337

DOOR SECURING DEVICE

John J. Greco, 713 E. Sahara, Las Vegas, Nev. 89105

Filed May 13, 1976, Ser. No. 686,105
Int. Cl.² E05C *17/44*
U.S. Cl. 292—338 **1 Claim**



1. A door securing device comprising an assemblage of standard hardware items, in combination:

a hinge comprising a first and second element pivotally connected in common adapted to be secured by said first element thereof to a selected area of said door;

a conduit hanger adapted to be pivotally secured over said first element of said hinge for selective disposition relative said second element of said hinge;

said conduit hanger includes a planar segment pivotally secured over said first element and a convoluted segment extending from one edge of said planar segment, said convoluted segment being conformed to receive said second element of said hinge in a first mode and to oppose said second element in a second mode,

a wing nut mounted proximate said first element of said hinge for selective securing of said conduit hanger;

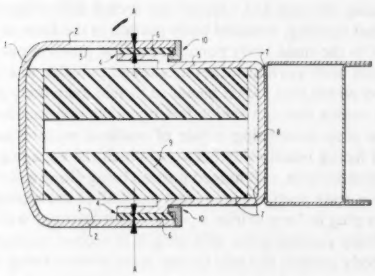
a plurality of threaded bolt assemblies secured to orthogonally extend in engaging alignment from said second element.

4,082,338

SHOCK ABSORBER FASHIONED AS AN ELASTOMERIC HOLLOW SPRING

Hubert Hutai, Grafenau; Wolfgang Klie, Korntal, and Helmut Weisshappel, Sindelfingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed May 6, 1976, Ser. No. 683,827
Claims priority, application Germany, May 7, 1975, 2520327
Int. Cl.² B61F *19/04*
U.S. Cl. 293—85 **8 Claims**



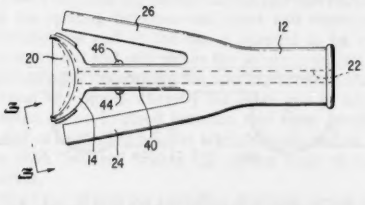
1. In a shock absorber arrangement which comprises at least one hollow elastomeric member being arranged between a vehicle bumper means and a fixed vehicle part, and socket means for accommodating said elastomeric member at an end facing said fixed vehicle part, wherein said socket means engages the elastomeric member, and wherein said socket means has outer surface portions abutting interior surfaces of said bumper means, the improvement comprising friction means inserted under prestress between said outer surface portions and said interior surfaces of said bumper means for effecting increased shock absorption capabilities, wherein angularly bent end means are provided at ends of said surfaces of said bumper means for covering said friction means from the outside, said angularly bent end means being supported at said socket means, and wherein said socket means includes a radially outwardly offset end portion pointing generally outwardly of the vehicle, said friction means being interposed between said offset end portion and said interior surfaces of said bumper means.

4,082,339

SOFT CONTACT LENS INSERTION AND REMOVAL INSTRUMENT

Joseph Ross, 14335 Sherman Way, Apt. 202, Van Nuys, Calif. 91405

Filed Jul. 18, 1977, Ser. No. 816,703
Int. Cl.² A61F *9/00*
U.S. Cl. 294—1 CA **14 Claims**



1. A delicate instrument for inserting and removing soft or flexible-type contact lenses, comprising:

a resilient soft contact lens holder, said holder including

a pair of wedge-shaped contact lens engaging members, said engaging members having the overall configuration of diametrically opposed segments of the circumference of a circle, with said wedge-shaped members pointing inwardly and at an acute angle above the plane of said circle; and resilient means interconnecting said two wedge-shaped lens engaging members and making an acute angle with respect to said lens engaging members, said resilient interconnecting means providing a range of movement for said lens engaging means extending from separation slightly more than the diameter of a soft contact lens, to a holding position with a separation slightly less than the diameter of said soft lens;

means for supporting said soft lens holder; and

means for selectively maintaining said lens engaging members in the holding positions, or releasing said lens engaging members from said holding position.

4,082,340

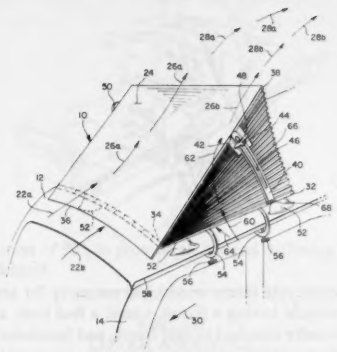
AIR CURRENT DEFLECTING DEVICE

Alexander Taylor, 855 Chapleau Dr., Pickering, Canada (L1W 1P5)

Filed Aug. 3, 1976, Ser. No. 711,247
Int. Cl.² B62D *35/00*
U.S. Cl. 296—1 S **7 Claims**

1. An air current deflecting device for a towing vehicle pulling a towed vehicle comprising an elongated deflecting plate spaced above the roof of the towing vehicle, the deflecting plate having a face portion with leading and trailing edges, the trailing edge normally being positioned above and rearwardly of the leading edge so that the face portion deflects a portion of the air passing over the roof of the towing vehicle, an elongated base plate hingably secured to the deflecting plate along a line extending across the width of the towing vehicle, the line being disposed intermediate the leading edge and the trailing edge, means to detachably secure the base plate in

spaced apart relationship above the roof of the towing vehicle, means to secure the deflecting plate at selected angles of inclination relative to the plane of the roof of the towing vehicle above the base plate, a pair of symmetrical pleated accordian-like side walls extended between and limited to the opening



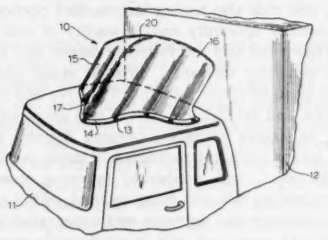
formed between adjacent marginal side edges of the base plate and the deflecting plate, said side wall having a plurality of pleats, said plurality of pleats extending angularly relative to one another intersecting at an apex located at said line, whereby said plurality of pleats accommodate disposing said deflecting plate at said selected angles.

4,082,341

VEHICLE AIR DEFLECTOR

Bobby Joe Gore, 1440 D. Cameron Ct., Wilmington, N.C. 28401

Filed Dec. 20, 1976, Ser. No. 752,475
Int. Cl.[2] B60J *9/04*
U.S. Cl. 296—1 S **5 Claims**



1. A vehicle air deflector used in combination with a tractor pulling a trailer, said tractor including a cabin roof, said trailer including a front wall located behind and extending above said tractor cabin roof, said vehicle air deflector being formed as a substantially V-shaped structure comprising:

(a) a pair of side panels each having leading, trailing and upper edges and a base, said panels converging at their leading edges to form a juncture line which is inclined rearwardly at an angle of attack "X" between 20°–30° from the vertical, said panels diverging outwardly and rearwardly from said juncture line to their trailing edges, the front face of each said side panel having a concave-convex curvature characterized by a valley surface rearward of said juncture line and an elongated mound surface rearward of said valley surface and forward of the trailing edge, said valley surface and elongated mound surface extending substantially from the base to the upper edge of each panel (15), (16) and having midlines substantially parallel to said juncture line, and said panels being characterized by all lines thereon which are parallel to said juncture line having an angle of attack substantially equal to said angle of attack "X"; and

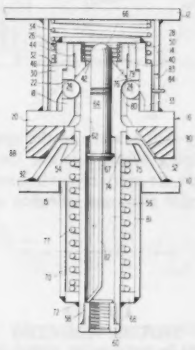
(b) means for securing the base of said side panels to the tractor cabin roof.

4,082,342

LATCHING MECHANISM

Roger Howard Ailshie, and Roy Reynolds, both of New Berlin, Wis., assignors to Applied Power, Inc., Milwaukee, Wis.

Filed Jun. 16, 1976, Ser. No. 696,591
Int. Cl.[2] B60J *1/00*
U.S. Cl. 296—28 C **11 Claims**



1. A motor vehicle having an elongated chassis member, a cab member pivotally mounted to said chassis member about an axis transverse to the longitudinal axis of said chassis member for a movement from a lowered first position to a second raised position, a releasable latching mechanism comprising,

a sheath having an outer end extending from one of said members toward the other of said members,

a housing on the other end of said members to receive said outer end,

a piston slidably received in said sheath along the longitudinal axis of said sheath,

means in said housing to support a plurality of detents for radial movement,

said sheath having on its outer surface a detent locking groove,

second means in said housing having a first position normally moving said detents into said locking groove and a second position wherein said detents are free to move out of said locking groove,

a source of hydraulic power to cause said piston to move said second means to its second position when it is desired to unlatch said members, and

third means retaining said detents radially outwardly when said members are disengaged.

4,082,343

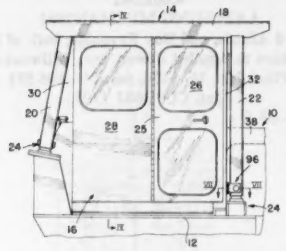
RESILIENTLY MOUNTED CAB-SIDEWALL RETAINER

William C. Hurt, II, Brimfield; Bruce W. Miers, Peoria Heights, and Eugene O. Mossner, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 563,777, Mar. 31, 1975, abandoned, which is a continuation of Ser. No. 435,754, Jan. 23, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,528
Int. Cl.[2] B62D *27/04*
U.S. Cl. 296—28 C **8 Claims**

1. In a tractor including an operator platform, a rollover operator protection structure about and over said platform, a cab formed of a material such as sheet metal enclosing said platform and secured at its upper end to said rollover operator protection structure to be supported thereby and elongated resilient means at least partially about the lower periphery of

the cab sealingly engaging at least a corresponding portion of said platform, the improvement wherein said resilient means is resiliently secured along its length to both said platform and said cab lower periphery whereby the lower portion of the cab



cannot appreciably shift relative to the upper portion of the cab while maintaining a seal between the cab interior and exterior to preclude the entry of environmental material into said cab and minimize noise and vibration within said cab.

4,082,344

MOTOR VEHICLES

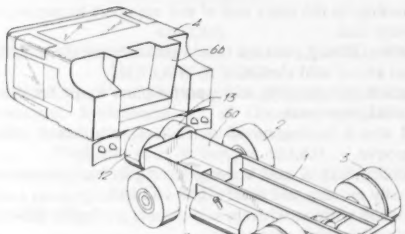
James Anderson, Preston, England, assignor to British Leyland UK Limited, London, England

Filed Jul. 9, 1976, Ser. No. 703,932

Claims priority, application United Kingdom, Jul. 18, 1975, 30158/75

Int. Cl.² B62D *33/06*

U.S. Cl. 296—28 C **10 Claims**



1. A truck comprising:

a. a chassis on which an engine is mounted;

b. a cab tiltably mounted on the chassis and in its operative position overlying the engine at least in part;

c. an enclosure surrounding the engine when the cab is in its operative position, the enclosure comprising substantially two parts, a first fixed part carried by the chassis and a second movable part carried by the cab so that when the cab is tilted the second part separates from the first part to expose at least part of the engine;

d. the engine enclosure having at least one air inlet in its leading end which is positioned in the front of the fixed part of the enclosure and therefore relatively low down and at east one air outlet located at the rear end of the enclosure in the second movable part of the enclosure and therefore relatively high up so as to promote convection currents within the enclosure for cooling the engine after it has been stopped.

4,082,345

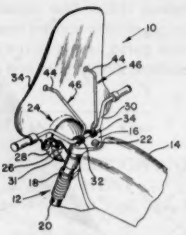
MOTORCYCLE WINDSHIELD ASSEMBLY

Barry A. Willey, 138 S. 8th Ave., Maywood, Ill. 60153

Filed May 12, 1976, Ser. No. 685,707

Int. Cl.² B62J *17/04*

U.S. Cl. 296—78.1 **4 Claims**



1. A motorcycle safety windshield assembly for attachment to a motorcycle having a frame, a seat, a fuel tank, a steering crown pivotally attached to said frame, and handlebars with at least portions thereof extending upwardly from said steering crown, said windshield assembly being adapted to direct air around a motorcycle rider sitting erect on said seat, and further adapted to provide injury protection for said rider, said windshield assembly comprising, in combination, a windshield panel having an upper portions, a lower portion for disposition adjacent said steering crown, lower fastening means for attaching said lower portions of said windshield panel to a portion of said motorcycle which moves as said steering crown is moved, and means for attaching said upper portion windshield panel to another, spaced apart portion of said motorcycle which also moves as said steering crown moves, said means for attaching said upper windshield portion including a pair of rods with lower portions having fastening means thereon for attachment to said motorcycle in the vicinity of the handlebars thereof, said rod fastening means preventing fore-and-aft movement of said rods, said rods also having intermediate portions extending substantially upwardly and forwardly of said seat, said steering crown and said rod fastening means, said rods terminating in generally forwardly directed upper end portions which are disposed in use substantially above said motorcycle tank, crown, and handlebars, each of said upper end portions including an axially extending opening therein, windshield fastening means extending through said upper portion of said windshield panel, said windshield fastening means having portions extending into and being secured within said axially extending openings and fastening said upper windshield panel portion to said upper rod ends in substantially perpendicular relation thereto so as to support said upper windshield panel against rearward movement in response to wind forces, said rods being free from upwardly and rearwardly projecting portions lying about the level of said seat, tank, and handlebars.

4,082,346

VEHICLE WINDSHIELD

Jules Perreault, and Emile Bombardier, both of Valcourt, Canada, assignors to Bombardier Limited, Valcourt, Canada

Filed Jul. 27, 1976, Ser. No. 709,095

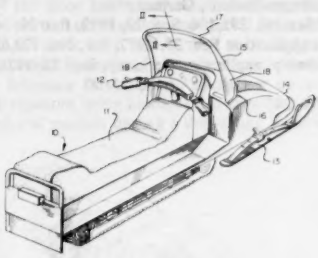
Claims priority, application Canada, Oct. 3, 1975, 237028

Int. Cl.² B60J *1/02*

U.S. Cl. 296—84 R **3 Claims**

1. A vehicle windshield comprising: a unitary contoured sheet of transparent plastics material having an upwardly and rearwardly directed central section the lateral sides of which merge into rearwardly extending side sections, the lower margin of said sheet being adapted for attachment to the vehicle, the upper edge of the central section and the rear edge of each side section being reinforced solely by a marginal area extend-

ing along said edges being sharply curved rearwardly transversely to the length of said edges through an angle of curva-

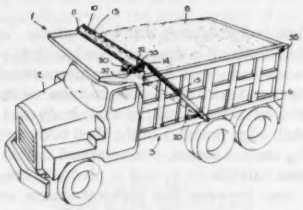


ture in excess of 90°, to provide an integral stiffening means on the windshield.

4,082,347
COVER ASSEMBLY

Raymond H. Petretti, Whitestone, N.Y., assignor to Toneray Covers, Inc., Whitestone, N.Y.

Division of Ser. No. 567,498, Apr. 14, 1975, Pat. No. 4,030,780. This application Nov. 26, 1976, Ser. No. 745,061
Int. Cl.² B60J 7/06
U.S. Cl. 296—98 **1 Claim**

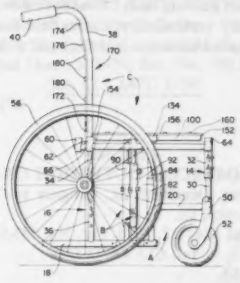


1. A cover assembly for a truck having a front cab portion and a rear tiltable open dump body, said cover assembly comprising a flexible cover, a rotatable rod at the front end of the open body, said cover being rolled around said rod and having one end mounted thereon, a cover pulling bar extending across the top of the open body and movable from one end of the open body to the other end of the open body, the other end of said cover being mounted on said pulling bar, a rotatable gear mechanism for controlling the rotation of said rod, said gear mechanism comprising a first sprocket mounted on the rotatable rod and a power source, said power source including a second sprocket and a chain connecting said first and second sprockets together, means for rotating the rotatable gear mechanism in one direction to rotate the rod in one direction to unroll the cover, means for moving the pulling bar toward the rear of the open body in one direction while the rod is being rotated in said one direction to move the cover to a body-covering position, means for rotating the rotatable gear mechanism in the opposite direction to rotate the rod in the opposite direction to roll up the cover and move the cover pulling bar toward the front of the open body, said cover pulling bar mounted on the upper ends of a pair of arms extending from opposite ends of the pulling bar along the sides of the open body, the lower ends of said arms are pivoted on a lower common shaft which extends transversely of and below the open body, said shaft being pivotally mounted below the open body, a finger extending from said lower shaft in a direction away from said arms, said finger being located below said open body, said bar-moving means comprising a spring, an adjustment bolt mounted on the forward portion of and below said open body, said spring having one end connected to said finger and its other end connected to said adjustment bolt and being spaced below said body when said cover is in its open position, the tension of the spring being adjustable by rotating the said adjustment bolt and lock clips adjacent the rear of the open body to hold the arms in the cover-closing rear position.

4,082,348
ADJUSTABLE WHEEL CHAIR

Gilbert E. Haury, Litchfield, Ohio, assignor to Invacare Corporation, Elyria, Ohio

Filed Mar. 1, 1976, Ser. No. 662,892
Int. Cl.² B62M 1/14
U.S. Cl. 297—45 **13 Claims**



1. A collapsible wheel chair structure for permitting independent width and height adjustment of the seat, said wheel chair structure comprising in combination:

a pair of side frame assemblies disposed in a spaced apart side by side relationship, each of said side frame assemblies having upper and lower frame members, said front and rear frame members each being comprised of first and second portions longitudinally movable relative to each other;

first locking means cooperating between said first and second portions of said front and rear frame members for selectively locking said first and second portions in a desired longitudinal relationship with each other for varying the effective length of said front and rear frame members and the distance between said upper and lower frame members;

a front wheel disposed adjacent each of said front frame members and a rear wheel disposed adjacent each of said rear frame members, said front and rear wheels connected to said structure;

first and second cross brace assemblies pivotally connected together and extending generally transversely between said side frame assemblies intermediate said front and rear frame members, said cross brace assemblies each including first and second cross brace portions with one of said first and second cross brace portions being longitudinally movable relative to the other of said first and second cross brace portions, one end of one cross brace assembly being pivotally mounted to the lower frame member of one side frame assembly with the other end thereof extending to a position adjacent the upper frame member of the other side frame assembly and one end of the other cross brace assembly being pivotally mounted to the lower frame member of said other side frame assembly with the other end thereof extending to a position adjacent the upper frame member of said one side frame assembly, said cross brace assemblies permitting selective movement of said side frame assemblies relative to each other between a first closed position with said side frame assemblies closely spaced toward each other and a second opened position spaced apart from each other;

second locking means cooperating between the first and second cross brace portions of each cross brace assembly for selectively locking said first and second cross brace portions in a desired longitudinal relationship with each

other for varying the effective length of said cross brace assemblies and the effective distance between said first and second side frame assemblies when said assemblies are moved to said second position;

a seat extending between said side frame assemblies and having side edges operably connected to each cross brace assembly other end;

a seat back extending between said side frame assemblies at said rear frame members thereof;

means for selectively altering the size of said seat and seat back as the spacing of the side frame assemblies is altered; and,

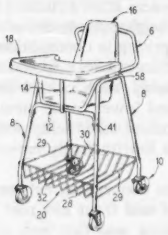
guide means for guiding each cross brace assembly other end in a generally vertical direction as said side frame assemblies are moved between said first and second positions.

4,082,349

COMMERCIAL DUTY HIGH CHAIR

William Ballenger, Deerfield, Ill., assignor to Central Specialties, Inc., Chicago, Ill.

Filed May 12, 1976, Ser. No. 685,930
Int. Cl.[2] A47D *1/00*
U.S. Cl. 297—183 **12 Claims**



1. A long life high chair with rollers, including

a one piece molded seat, a curved skirt portion at the edge of the seat,

a looped upper frame member, having spaced side parts connected by a front part and a forwardly tilted rear part, said rear part having steering and pushing handle portions, each of the handle lower ends joined to each of the side parts and each of the handle upper ends joined to a transverse top portion, said handle and transverse portions touching a plane which forms an acute angle with a plane common to the side and front parts,

spaced unitary leg members, each leg member having a front leg and a rear leg and a connecting portion joining the tops of the legs, a caster assembly mounted to the bottom of each leg, curved side skirt portions sandwiched between the side parts of the upper frame member and the top connecting portions of the leg members in secured relationship,

a cross brace spanning the pair of aligned front legs of the unitary leg members, said cross brace engaging a forward portion of said unitary molded seat, said means fastening said cross brace to said aligned front legs, said cross brace positioned to support a forward part of the unitary molded seat along the curved skirt portion,

crotch retaining means to be secured between the central portions of said cross brace and said front part of the looped upper frame member, and

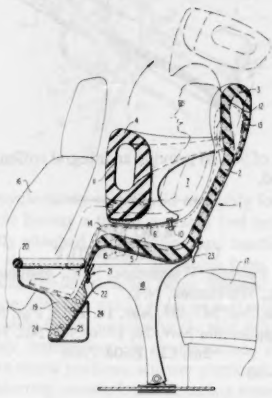
a basket member having a plurality of rigid peripheral rods and each of a pair rods being secured to adjacent legs, whereby said basket is mounted between the leg members and further braces such leg members.

4,082,350

SHELL-SHAPED CHILDREN'S SEAT FOR VEHICLES

Johann Tomforde, Magstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Division of Ser. No. 291,184, Sep. 22, 1972, Pat. No. 4,039,225.
This application Feb. 28, 1977, Ser. No. 772,680
Claims priority, application Germany, Sep. 22, 1971, 2147248
Int. Cl.[2] A47C *15/00*
U.S. Cl. 297—243 **19 Claims**



1. A shell-shaped children's seat for a vehicle, especially for a motor vehicle, which is equipped with a shell body with a seating surface means, with a backrest means terminating in a headrest means and with an impact cushion means extending substantially over a width of the shell body and resting on associated shell edge portions of the shell body within an area of the seating surface means, characterized in that the impact cushion means extends up to and is pivotally connected at a transitional area between the backrest means and headrest means, said impact cushion means being adapted to be tilted up visor-like after a disengagement of a locking means between the impact cushion means and the seating surface means for convenient boarding and leaving of the seat, the impact cushion means is provided with lateral indentations for extending therethrough the child's arms and with recesses at the bottom side thereof for extending therethrough the child's legs, the headrest means includes a force dissipating deformation member which has an approximately loop-shaped cross-section and is supported at a back wall means forming a part of the shell body, and in that a relatively fixed bracket means equipped with a footrest means having a padded bead means is provided between front and rear seats of the motor vehicle, a transverse slot means receiving a front edge of the children's seat is provided at the footrest means, and in that a detachable connection between the fixed bracket means and the back wall means of the shell body takes place by at least one rapid connecting means.

4,082,351

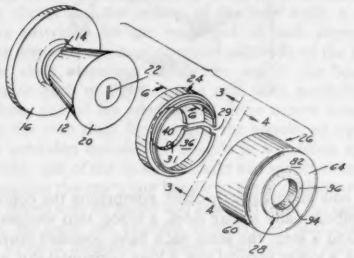
SAFETY COVER FOR A DOOR KNOB

Anthony Chrones, Warwick, R.I., assignor to Reliance Products Corporation, Woonsocket, R.I.

Filed Mar. 2, 1977, Ser. No. 773,644
Int. Cl.[2] E05C *21/00*; E05B *13/00, 1/04*
U.S. Cl. 297—347 **13 Claims**

1. A safety cover for application to a door knob which is assembled on a door and designed to complicate the opening of the door by small children comprising a pair of inner and outer annular cover parts having a hollow interior, with the inner cover part having a shank engaging rim portion surrounding a centrally located opening therein and an annular ring-like portion terminating in an annular fastening formation, a slot

extending through said rim portion and annular ring-like portion to permit the opening of said inner cover part for placement of the rim portion thereof around the shank of the door knob and said ring-like portion around and spaced from a portion of the door knob, said outer cover part including a cylindrical portion surrounding and spaced from the remaining portion of the door knob and having at one edge thereof an annular fastening formation for engaging and completely covering the fastening formation on said inner cover part, said engaged formations being hidden from view, the other edge of said cylindrical portion having a depending flexible wall portion which faces the front surface of the door knob and is provided with a centrally located opening therein, said flexible wall portion having inner and outer surfaces, a resiliently relatively thin pressure pad carried by said outer cover part and abutting the inner surface of said flexible plate portion for frictional engagement with the front surface of the door knob, said safety cover when turned rotating freely on the door knob and shank, said safety cover gripping the door knob and turning same when a sufficient force is applied to the outer surface of said flexible wall portion which urges said pressure pad against and into frictional engagement with the front surface of the door knob.



4,082,352

SEAT BACK RECLINER

Emmett R. Bales, and Randal T. Murphy, both of Morristown, Tenn., assignors to Lear Siegler, Inc., Morristown, Tenn.

Filed Jan. 13, 1977, Ser. No. 759,205
Int. Cl.² A47C *1/025*
U.S. Cl. 297—364 **14 Claims**

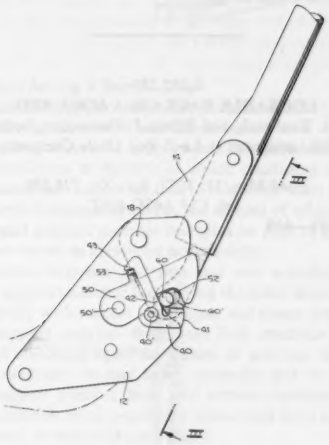
1. a seat back recliner comprising: seat back and cushion arms having plate-like ends connected to each other for movement about a pivotal axis; a plate-like locking ring positioned between the arm ends fixed to one of the arm ends encircling the pivotal axis; said locking ring including inwardly extending teeth arranged in an arcuate shape about the pivotal axis; a plate-like locking dog slidably supported on the other arm end within the locking ring between the arm ends; said locking dog having a toothed end for engaging and disengaging the ring teeth; manually operable actuating means for moving the locking dog between a locking position where the toothed end thereof engages the ring teeth to prevent pivoting of the seat back arm and a nonlocking position where the toothed end thereof is disengaged from the ring teeth to allow pivotal adjustment of the seat back arm and movement thereof to a forward easy-enter position; and blocking means operatively associated between the locking dog and the arm end on which the locking ring is fixed to prevent engagement of the toothed dog end and the locking ring during the forward extend to pivotal movement of the seat back arm to and from the easy-enter position with the actuating means manually released.

4,082,353

PAWL SEAT BACK LATCH MECHANISM

William M. Hollowell, Pacific Palisades, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Dec. 13, 1976, Ser. No. 750,181
Int. Cl.² A47C *3/00*
U.S. Cl. 297—379 **4 Claims**



1. An inertia-responsive vehicle seat back latch mechanism for a vehicle seat assembly having a seat cushion support, and a seat back pivotally supported for forwardly tilting movement, said latch mechanism comprising:

first means integrally attached to said seat back for moving with said seat back; and

second means attached to said seat cushion support for being cammed free by said first means during a vehicle deceleration up to a first predetermined value, and said second means including means for lockingly engaging said first means during a vehicle deceleration greater than said first value so that said seat back is prevented from tilting forward.

4,082,354

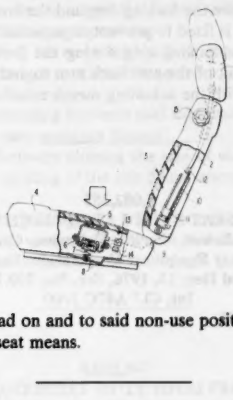
HEAD SUPPORT FOR BACKREST, ESPECIALLY OF MOTOR VEHICLES

Hermann Renner, Magstadt, and Siegfried Wacker, Schonaich, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Mar. 24, 1976, Ser. No. 669,769
Claims priority, application Germany, Mar. 25, 1975, 2513022
Int. Cl.² A47C *1/10*
U.S. Cl. 297—410 **15 Claims**

1. A head support for backrests which is operable to be displaced to and from a non-use position and an effective

position, characterized by control means for automatically moving the head support to said effective position in dependence on the load on and to said non-use position on removal of load from a seat means.

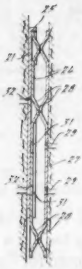


4,082,355

LOCKABLE BACK ON A SOFA BED

Edward M. Knabusch, and Edwin J. Shoemaker, both of Monroe, Mich., assignors to La-Z-Boy Chair Company, Monroe, Mich.

Filed Mar. 11, 1977, Ser. No. 776,501
Int. Cl.² A47C 4/02
U.S. Cl. 297—440 **2 Claims**



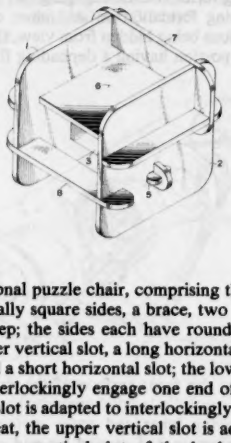
1. In an upholstered sofa, an upholstered base frame, an upholstered back frame, said frames being separately upholstered, separable hardware on facing areas at the rear of the base frame and near the bottom of said back frame at both ends of the sofa, said separable hardware embodying a pair of slide brackets and a pair of support brackets, one support bracket secured on each end of the facing areas of the base frame, each slide bracket has the side edges reversely bent to form facing channels, said support brackets being made of two elongated strips, each having a pair of spaced conical portions at one end and a single conical portion spaced therefrom at the other end, said conical portions being joined at the smaller ends to provide a rear strip securable to the facing areas near the bottom ends of the back frame with the front strip forming slides at the side edges which extend into the facing channels of the slide bracket when moved downwardly thereover, and means on the slide bracket which engages and is secured to the support bracket for retaining the back frame in secured position on the base frame, the said strips having aligned apertures therethrough in the space between the one conical portion at one end and the two conical portions at the other end for screws and the like to secure the joined strips to the base frame, said retaining means on the slide bracket being a pivoted cam which is movable to lock the slide brackets onto the support brackets.

4,082,356

EDUCATIONAL PUZZLE CHAIR

Karin Ruth Johnson, 123 Glen Dr., Sausalito, Calif. 94965

Filed Feb. 25, 1977, Ser. No. 772,123
Int. Cl.² A47C 7/00
U.S. Cl. 297—442 **6 Claims**



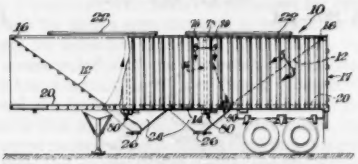
1. An educational puzzle chair, comprising the combination of two substantially square sides, a brace, two wedges, a seat, a back, and a step; the sides each have rounded corners and four slots, a lower vertical slot, a long horizontal slot, an upper vertical slot, and a short horizontal slot; the lower vertical slot is adapted to interlockingly engage one end of the brace, the long horizontal slot is adapted to interlockingly engage a vertical slot of the seat, the upper vertical slot is adapted to interlockingly engage a vertical slot of the back, and the short horizontal slot is adapted to interlockingly engage a vertical slot of the step; the wedges are adapted to interlockingly engage in two slots of the brace; all of the components are of such a size that they can be handled by pre-school children.

4,082,357

CONVERTIBLE VEHICLE BODY

George A. Schmidt, Langhorne; Ronald L. Zubko, Cornwells Heights, and Andrew Abolins, Langhorne, all of Pa., assignors to Strick Corporation, Fort Washington, Pa.

Filed Aug. 27, 1976, Ser. No. 718,106
Int. Cl.² B60P 1/56
U.S. Cl. 298—27 **7 Claims**



1. A convertible vehicle body for transporting loose bulk or discrete cargo comprising a substantially rectangular floor, sidewalls, and roof forming said body, a hopper mounted below a portion of said floor for collecting and discharging bulk cargo disposed above it, the portion of said floor above said hopper comprising a grating capable of supporting said discrete cargo and having openings for permitting said loose bulk cargo to pass through it, hinge means within said body adjacent the ends of said roof, a slope sheet disposed in the ends of said body on both sides of said hopper for alternatively forming an inclined continuation of said hopper for transporting loose bulk cargo or for retraction upwardly therefrom to permit the entire length of the body to be used for transporting discrete cargo, the outer end of each of the slope sheets being rotatably connected within the body by the hinge means, flexible hoisting means connected from the roof of the body to the inner ends of each of the slope sheets for raising and lowering the inner ends from adjacent the roof of the body to the floor grating, operating means connected to the flexible hoist-

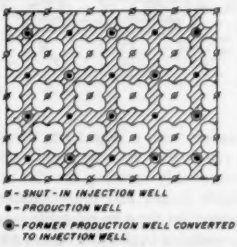
ing means for raising and lowering the inner ends of the slope sheets, latching means disposed adjacent the roof of the body and the raised inner ends of the slope sheets whereby said raised inner ends of the slope sheets are detachably secured, unlatching means connected to the latching means whereby the inner ends of the slope sheets may be released for lowering, slanting shelf channels on the inner sides of the body corresponding to the position of the sides of the slope sheets when they are in the hopper containing position, the outsides of the slope sheets being constructed and arranged for engaging the shelf channels to form a substantially tight seal therewith for preventing loose bulk cargo from passing between the sides of the slope sheets and the insides of the side walls, a pair of spools are provided for the inner end of each slope sheets which are disposed adjacent opposite sidewalls of the body, a transverse shaft extending across the top of the body and connected to each of the spools, a stub shaft extending outwardly from one of the spools, said drive means being connected to the stub shaft for rotating the spools, an operating handle is provided outside the vehicle in a position approximately under one of the spools, a chain and sprocket transmission connecting the operating handle to the stub shaft whereby the slope sheets may be raised and lowered from the outside of the body, the body has external vertical ribs, said chain and sprocket drive is disposed between a pair of said ribs, and a cover is mounted upon and across said pair of ribs to cover said chain and sprocket transmission.

4,082,358

IN SITU SOLUTION MINING TECHNIQUE

Robert P. Learmont, Feeley Township, Itasca County, Minn., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 2, 1976, Ser. No. 654,310
Int. Cl.[2] E21B *43/28*; E21C *41/14*
U.S. Cl. 299—4 **7 Claims**



1. Method of establishing a secondary production pattern for in situ leaching of mineral values from a formation wherein a primary leaching process has been conducted through an array of contiguous 5-spot leaching patterns of production wells and injection wells, comprising converting all the production wells in alternate rows diagonal to the original pattern to injection wells.

4,082,359

METHOD FOR THE RECOVERY OF A MATERIAL

Andrew P. Spence, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.; NM Uranium, Inc., Houston, Tex. and United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 17, 1976, Ser. No. 715,342
Int. Cl.[2] E21B *43/28*; E21C *41/14*
U.S. Cl. 299—4 **8 Claims**

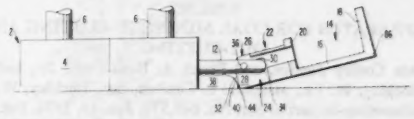
1. An improved method for the solution mining of a mineral from a subterranean formation containing same in which an injection and production well are drilled and completed within said formation, leach solution and an oxidant are injected through said injection well into said formation to dissolve said mineral, and said dissolved mineral is recovered via said production well, wherein the improvement comprises switching the functions of said wells when the oxidant concentration of the produced solution at said production well becomes greater than five parts per million, whereby said production well is utilized to inject said solution and oxidant and said injection well is utilized to recover said dissolved mineral.

4,082,360

MINING APPARATUS AND METHOD

John A. L. Campbell, Action, and Daniel J. Moynihan, Chelmsford, both of Mass., assignors to Peabody Coal Company, Belleville, Ill.

Filed Jun. 23, 1976, Ser. No. 698,885
Int. Cl.[2] E21D *15/48, 23/04*
U.S. Cl. 299—33 **16 Claims**



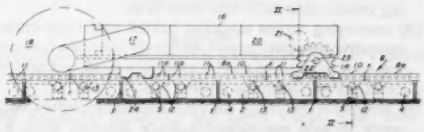
1. A chock having a base,
a ram horizontally moveable between inner and outer extremities at one side of said chock base,
an articulated conveyor support member shiftable between two conditions in the first of which conditions said support member occupies an area of relatively wide extent as measured horizontally and in the second of which conditions said support member occupies an area of relatively narrow extent as measured horizontally,
a connection between said ram and said articulated conveyor support member for moving the latter inwardly and outwardly with respect to the base, and means for shifting said support member from said first condition to said second condition upon movement of said ram from said outer extremity to said inner extremity and for shifting said support member from said second condition to the first condition upon movement of said ram from said inner extremity to said outer extremity,
said articulated conveyor support member comprising a pair of flange members, in the first of which conditions said flange members are disposed in laterally spaced relation to one another and in the second of which conditions they are disposed in vertically spaced relation to one another.

4,082,361

RACK DEVICE FOR A MINING MACHINE

Willy Lanfermann, Bochum, Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Jul. 6, 1976, Ser. No. 702,890
Claims priority, application Germany, Jul. 10, 1975, 2530754
Int. Cl.[2] E21C *29/02*
U.S. Cl. 299—43 **22 Claims**



1. In combination with a mining machine, a rack device at the side wall of a face conveyor which includes a plurality of conveyor trough sections arranged end-to-end for extending along a generally horizontal path of travel by the mining machine, said rack device including, in combination:
a plurality of elongated rack segments having spaced-apart drive members along the length of each segment,

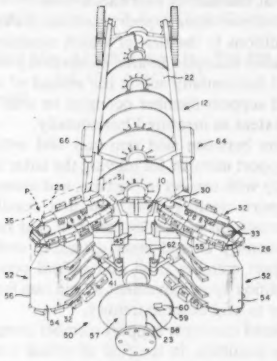
means connected with at least some of said conveyor sections to support the opposite ends of said rack segments at the side wall of the face conveyor for pivotal movement of each rack segment about horizontal axes, said means carrying the ends of adjacent rack segments in a spaced-apart relation to maintain a gap therebetween, at least some of said rack segments being coupled by said means with conveyor trough sections to bridge and maintain a gap between the ends of adjacent conveyor trough sections for unimpeded vertical movement and horizontal pivotal movement between the conveyor trough sections, and

a rotating element on said mining machine for driving engagement with the drive members of said rack segments to propel the mining machine along its course of travel.

4,082,362
APPARATUS FOR COAL MINING IN-CUTTING AND OUT-CUTTING

James Conley Justice, and Frank A. Delli-Gatti, Jr., both of Beckley, W. Va., assignors to Coaltex, Inc., Beckley, W. Va.

Continuation-in-part of Ser. No. 649,579, Jan. 16, 1976, Pat. No. 4,003,602. This application Jan. 18, 1977, Ser. No. 760,422
Int. Cl.² E21C *27/22*
U.S. Cl. 299—57 **21 Claims**



1. A mining machine for cutting an in-bore and an out-bore larger than said in-bore during in-cutting and out-cutting respectively, comprising

(a) a non-rotatable body member, with stabilizing means for insuring non-rotative movement of said body member in a bore,

(b) a rotatable pilot cutting head, mounted in front of said body member, and means for rotating said pilot cutting head for cutting a generally circular in cross-section bore, said means for rotating said pilot cutting head including a rotatable shaft extending through said non-rotatable body member to said pilot head,

(c) a pair of wing-cutters pivotally mounted to said non-rotatable body member behind said pilot head in non-interfering relationship with said pilot head,

(d) conveying means mounted behind said wing-cutters in operative association with said body member, for conveying coal or the like cut by said pilot head and said wing-cutters away from the cutting site,

(e) means for pivotally moving said wing-cutters with respect to said non-rotatable body member from a first position, wherein said wing-cutters are in general alignment with said pilot cutting head and body member, during in-cutting to a second position wherein each of said wing-cutters extends outwardly with respect to said pilot cutting head, during out-cutting,

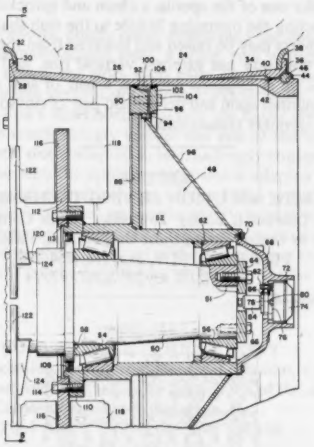
(f) means maintaining said wing-cutters in said second positions thereof during out-cutting thereby, and

(g) means for moving coal or the like cut by said wing-cutters during cutting toward the sides of the bore cut thereby, said means including (i) shield means associated with each of said wing cutters mounted for pivotal movement with said wing-cutters with respect to said body member, said shield means including a pair of shields, one associated with each wing-cutter, and disposed between said wing-cutter and said body member and said pilot head, and (ii) means surrounding said shaft for moving coal cut during in-cutting to the bore sides.

4,082,363
WHEEL RIM AND BRAKE DISC FOR OFF-HIGHWAY VEHICLES

Edgar R. Goodbary, Cardin, Okla., assignor to Goodbary Engineering Company, Cardin, Okla.

Filed Nov. 23, 1976, Ser. No. 744,437
Int. Cl.² B60T *1/06*
U.S. Cl. 301—6 CS **9 Claims**



1. In combination with a wheel rim for a vehicle, center support means removably secured within said wheel rim for rotatably and removably securing the rim to the vehicle and including rotatable means and non-rotatable means, caliper brake means secured to the non-rotatable means of the center support means, rotatable brake disc means removably secured to the rotatable means of the center support means and selectively engagable by said caliper brake means, and heat relief groove means provided on the inner periphery of the brake disc means for dissipating heat to preclude adhering of the brake disc member to the center support means.

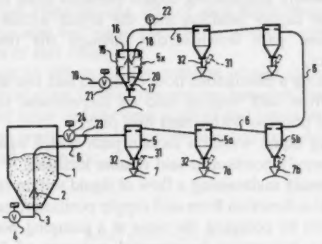
4,082,364
METHOD AND APPARATUS FOR CHARGING BULK MATERIAL TO A PLURALITY OF RECEIVING STATIONS

Wolfgang Krambrock, Ravensburg, Germany, assignor to Waeschle Maschinenfabrik GmbH, Ravensburg, Germany

Filed Aug. 27, 1975, Ser. No. 608,218
Claims priority, application Germany, Aug. 27, 1974, 2440888
Int. Cl.² B65G *53/04*
U.S. Cl. 302—28 **8 Claims**

1. A method of charging bulk material from a feed station to a plurality of receiving stations which are each connected in series to a pneumatic conveyor conduit by way of respective separators, comprising successively charging the individual receiving stations by way of their associated separators, each separator being substantially filled before bulk material is passed to the next successive separator, discharging exhaust air from the conveyor conduit circuit only at the most down-

stream separator, interrupting conveying by a blocking signal which is triggered when a predetermined level of material is reached in the last separator, and initiating continuation of



conveying only by reducing the level of material only in the most downstream separator below the level which triggers the blocking signal.

4,082,365

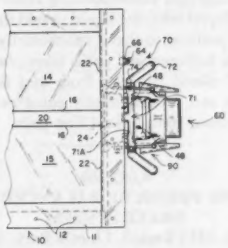
PNEUMATIC OUTLET OPERATING MECHANISM

Richard H. Dugge, St. Louis, and Ronald D. Van Dyke, Florissant, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 633,754, Nov. 20, 1975, abandoned. This application May 4, 1977, Ser. No. 793,494

Int. Cl.[2] B65G *53/52*

U.S. Cl. 302—52 **4 Claims**



1. A pneumatic outlet comprising: side walls, end walls and a lower housing forming an interior chamber; a valve member mounted within the interior chamber for controlling the flow of lading from said outlet; a tubular conduit rotatably mounted on and extending from at least one end of said outlet and communicating at one end with the interior chamber; means interconnecting said valve member and said tubular conduit whereby rotation of the tubular conduit actuates the valve member to control the flow of lading from the outlet; said tubular conduit having a cylindrical outer surface; a hub member having at least one handle extending therefrom mounted for rotary and axially sliding movement on the cylindrical surface; clutch means on the tubular conduit and on the hub member which interengage in one axial position of the hub and disengage in another axial position of the hub whereby when the clutch means are engaged, the tubular member is connected to said hub and is rotated when said hub member is rotated by the handle, and when said clutch means are disengaged, the hub is free to rotate without rotating the tubular conduit whereby the handle and hub may be re-positioned; said conduit having at least one annular surface adapted to engage a hose coupling for discharging the outlet; a removable end cap in closed position covering said annular surface; locking means on said cap for maintaining said cap in closed position; and indexing means on said cap and said hub for insuring that when said cap is applied to the outlet said hub is in proper position for rotating said valve when limited clearance exists below said outlet.

4,082,366

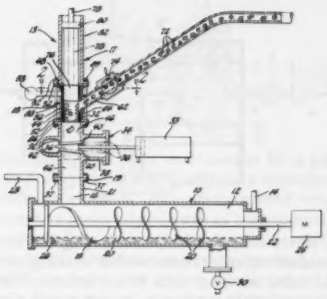
FEEDING APPARATUS FOR LIGHTWEIGHT PLASTIC PARTICLES INTO A HIGH PRESSURE REACTOR

Clifford C. Duff, Warren, and Robert J. Salloum, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1977, Ser. No. 779,161

Int. Cl.[2] B65G *65/32*

U.S. Cl. 302—11 **1 Claim**



1. Apparatus for intermittently transferring low density plastic foam particles from a zone of substantially atmospheric pressure into a reactor operated continuously at a pressure substantially above atmospheric pressure, comprising:

a cylindrical open ended housing defining an inner chamber, an inlet to said chamber through the wall of said housing for said particles, an outlet at one of said open ends in communication with said reactor,

a sleeve retained in said chamber spaced apart from the wall of said housing extending to said outlet from at least said inlet and perforated with holes from said inlet to said outlet, said holes being sized to pass air while retaining said particles,

a piston means mounted at the other of said open ends with a piston reciprocative in said sleeve between a first position extending through said outlet and a second position remote from said outlet, said inlet located between said first and second positions,

first valve means at said inlet for controlling the admission of said particles through said inlet into said chamber,

a closable air vent from said housing synchronized to open with said inlet valve to facilitate the admission of said particles into said chamber by creating a vacuum applied at the air vent,

second valve means between said outlet and said reactor movable between open and closed positions, isolating said housing from said reactor in its closed position and permitting the movement of said particles pushed by said piston into said reactor in open position.

4,082,367

CONTINUOUSLY CHARGED PIPE-CHAMBER FEEDER PROVIDED WITH DIVIDED OR INTERMEDIATE CHAMBER FOR HYDRAULIC MATERIAL HANDLING

László Kocsanyi, Budapest, and Lajos Varga, Eger, both of Hungary, assignors to Heves Megyer Tánacsi Épitóipare Vállalat, Eger, Hungary

Filed Feb. 17, 1976, Ser. No. 658,461

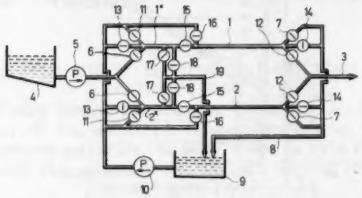
Claims priority, application Hungary, Feb. 18, 1976, 680

Int. Cl.[2] B65G *53/30*

U.S. Cl. 302—14 **2 Claims**

1. A pipe-chamber feeder apparatus for handling of a liquid, comprising in combination:

two pipe chambers having respective first and second ends,
a delivery duct selectively connectable to the first ends of said chambers,
a liquid supply pump selectively connectable to one of said chambers for supplying the liquid thereto,
a relatively high pressure pump selectively connectable to the other of said chambers for transporting a recyclable delivery medium through one of said pipe chambers,
a basin for said medium selectively connectable to the ends of said chambers,
two intermediate chambers, each of said intermediate chambers including a section adapted to be selectively locked, and selectively connectable with one end thereof to a corresponding one of said pipe chambers, and



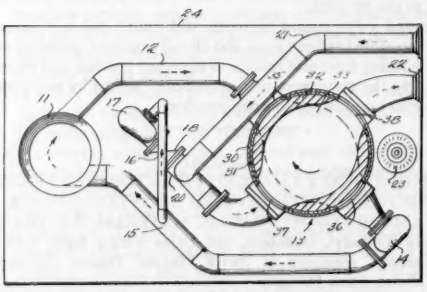
locking means for selectively connecting the ends of said intermediate chambers connectable to said pipe chambers to said basin, the other ends of said intermediate chamber being selectively connectable to one of said pumps,
whereby, upon a corresponding one of said sections being locked from a corresponding one of said pipe chambers, and upon said locking means being open to provide for the delivery medium to flow therethrough with the periodic assistance of said high pressure pump to alternately force the liquid through said pipe chambers, respectively, the liquid is supplied continuously through said supply pump to said pipe chambers in an alternate manner, and continuously discharged substantially free from pressure fluctuation through said delivery duct.

4,082,368

METHOD AND APPARATUS FOR HYDRAULIC TRANSMISSION OF COAL, OIL SHALE, MINERAL ORES, ETC. FROM THE FACE TO THE SURFACE OF UNDERGROUND MINES

Erwin D. Funk, Glens Falls, N.Y., assignor to Kamyr Inc., Glens Falls, N.Y.

Continuation-in-part of Ser. No. 489,038, Jul. 16, 1974, Pat. No. 3,982,789. This application Sep. 3, 1976, Ser. No. 720,391
Int. Cl.² B65G *53/30, 53/46*
U.S. Cl. 302—14 **4 Claims**



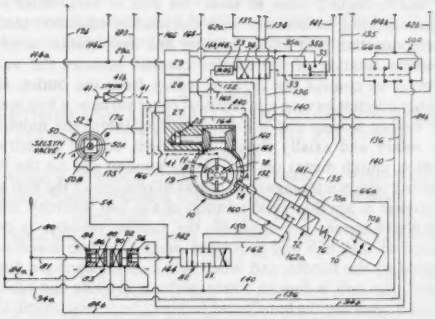
1. A process of continuously conveying mined material, such as coal or the like, from a mine site to a remote location, such as a point of utilization, said process comprising the steps of:
progressively moving a supply of mined particles from the position at which they are mined at the mine site to a supply position at the mine site,
confining a liquid within a first path including a volume defining a free surface disposed at said supply position,
progressively introducing mined particles from said supply at said supply position into the liquid within said first confined path downwardly through the free surface thereof,
maintaining a continuous flow of liquid and entrained particles from said volume into an incremental volume removal position within said first path,
confining liquid within a second path which extends from said supply position to said remote location,
continuously maintaining a flow of liquid within said second path in a direction from said supply position to said remote location by pumping the same at a pumping position,
removing successive incremental volumes of liquid and entrained particles within said first path adjacent said supply position by blocking the flow of particles above a predetermined small size at said incremental volume removal position while permitting liquid and particles less than said predetermined size to flow within said first path beyond said incremental volume removal position and communicating said succcessive removed volumes of liquid and entrained particles with the liquid flowing in said second path at a position adjacent said supply position downstream of said pumping position, and
removing a corresponding incremental volume of liquid from said second path adajacent said supply position at a position between said pumping position and said remote location for each successive incremental volume of liquid and entrained particles removed from said first path and communicating said corresponding removed incremental volumes of liquid with the liquid in said first path adjacent said supply position so that a substantially equal volumetric exchange between said paths takes place resulting in a net flow of mined particles from said first path to said second path and a substantially equal net flow of liquid from said second path to said first path.

4,082,369

ANTI-SKID AND PRESSURE BALANCED HYDRAULIC BRAKE SYSTEM

Richard D. Black, 1815 Russell, Lincoln Park, Mich. 48146, and Thomas E. Morgan, Jr., 2838 Aspen La., Bloomfield Hills, Mich. 48013

Filed Aug. 2, 1976, Ser. No. 711,110
Int. Cl.² B60T *8/02*
U.S. Cl. 303—3 **29 Claims**



1. A variable displacement rotary transmission device for use as a pump and motor in a hydraulic power system which comprises:
(a) a pump housing having a circular recess,
(b) a stator ring having a circular periphery movable in

rotation in said recess having a circular rotor recess off-center from the periphery,

(c) a rotor having radial vanes in the circular recess of said stator ring,

(d) a port plate on one side of said stator ring and rotor having inlet and outlet ports in the area of rotation of said vanes of said rotor, and

(e) means to effect relative rotation of said stator ring and said port plate to alter the spacing between the periphery of said rotor and the inner wall of said recess in said stator ring to create areas of compression and expansion for fluid around said rotor.

4,082,370

MONITORING DEVICE FOR AN ANTILOCKING BRAKE CONTROL SYSTEM

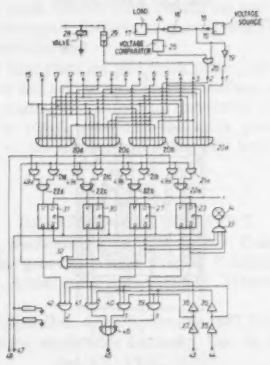
Heinz Leiber, and Udo Blasius, both of Leimen, Germany, assignors to Teldix G.m.b.H., Heidelberg, Germany

Filed Jan. 25, 1977, Ser. No. 762,454

Claims priority, application Germany, Feb. 4, 1976, 2604148

Int. Cl.[2] B60T *8/00*

U.S. Cl. 303—92 **9 Claims**



1. In the combination of an antilocking control system, including a plurality of different electrical components, for wheel brakes of a vehicle, and a monitoring device for the electrical components or groups of electrical components in said antilocking brake control system, said monitoring device including respective switching means, each connected to an associated component or group of components, for monitoring the components and for generating a signal at a respective output upon the occurrence of a malfunction, and a memory arrangement for storing any such generated signal; the improvement wherein: said switching means are associated with and monitor a plurality of different type electrical components or groups of electrical components which are located at correspondingly different points of the antilocking brake control system for malfunction; and said memory arrangement includes memory means, having a plurality of inputs, for providing at least a number of memory states which corresponds to the number of components or groups of components to be monitored, and circuit means for interconnecting the outputs of said switching means and the inputs of said memory means in such a manner that, upon occurrence of a signal indicating a malfunction, the memory state of said memory arrangement which is associated with the one of said switching means producing said signal indicating a malfunction will be actuated.

4,082,371

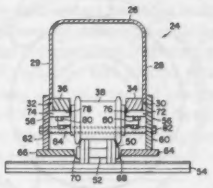
SUPPORT AND GUIDE FOR A TRACK OF A TRACK-LAYING VEHICLE

Gregory Keith Werner, Dubuque; Kenneth Oscar Switzer, Peosta, both of Iowa, and Raymond G. St. Laurent, Amos, Canada, assignors to Deere & Company, Moline, Ill.

Filed Aug. 2, 1976, Ser. No. 710,561

Int. Cl.[2] B62D *55/20*

U.S. Cl. 305—56 **4 Claims**



1. A track frame and track combination for a track laying vehicle comprising: a main longitudinally extending support member defining a pair of transversely spaced vertical walls having respective lower edges, a pair of longitudinal mounting bars respectively fixed to inner surface portions of the pair of walls in overlapping relationship to the respective lower edges of the walls; track support rollers connected to respective downwardly facing mounting surfaces of the pair of mounting bars at longitudinally spaced and aligned locations between the walls and having portions extending below the edges; a track drive sprocket supported at a first end of the support member; a track idler wheel supported at a second end of the support member; a track extending around the support member and thus defining upper and lower runs and including a plurality of track shoes having a width greater than the transverse dimension of said support member and being hingedly interconnected by pin assemblies including parts positioned so as to mesh with teeth of said sprocket as they travel thereover and to engage the support rollers when the track passes thereunder; track support and alignment means including first and second longitudinally extending track guide and support members including main vertical portions respectively fixed to and embracing outer surface portions of the pair of transversely spaced walls above the lower edges of the latter and extending therebelow and including respective guide and support portions extending generally horizontally above and adjacent to ground-contacting portions of the track shoes and including edge portions respectively terminating adjacent opposite ends of those of said pin assemblies located in the lower run of the track; and transverse mounting tabs fixed to the main vertical portions of the first and second track guide and support members and being releasably secured to the mounting surfaces of the pair of mounting bars.

4,082,372

NOISE REDUCING DEVICE FOR A TRACK CHAIN ARRANGEMENT

Naoto Kozuki, Sagamihara, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Nov. 18, 1976, Ser. No. 742,974

Claims priority, application Japan, Jan. 26, 1976, 51-007251

Int. Cl.[2] B62D *55/12*

U.S. Cl. 305—57 **5 Claims**

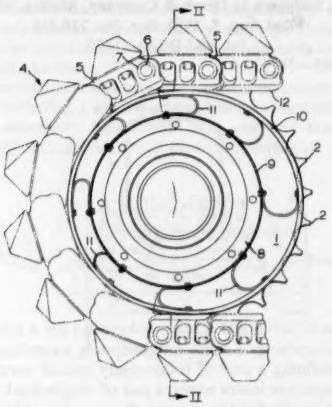
5. A noise reducing device for a track chain arrangement, the chain arrangement being of the type which includes a sprocket having a plurality of teeth provided thereon and a pair of endless track chains trained around the sprocket, each chain having an inwardly facing surface, the noise reducing device comprising:

a pair of annular supporting brackets secured to the opposite sides of the sprockets;

a plurality of curved plate springs secured to the radially

outer surfaces of said pair of annular supporting brackets; and

a pair of resilient metal hoops individually encircling and spaced outwardly from the annular supporting brackets



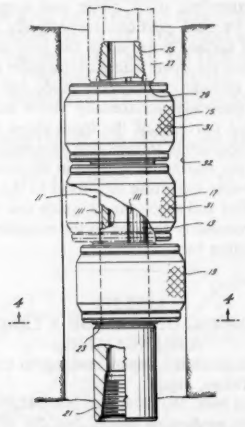
and secured to the respective curved plate springs whereby said resilient metal hoops resiliently engage the inwardly facing surface of said track chains to lessen the impact between the track chains and the sprocket teeth.

4,082,373

TANDEM ROLLER STABILIZER FOR EARTH BORING APPARATUS

Jackson M. Kellner, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Filed Sep. 7, 1976, Ser. No. 721,090
Int. Cl.[2] E21B *17/10*
U.S. Cl. 308—4 A **7 Claims**



1. Wall contacting tool, comprising

a tubular body including a portion providing a mandrel having a generally cylindrical outer periphery,

a plurality of eccentric roller assemblies disposed in tandem along the length of the mandrel, and

orientation means for positioning said roller assemblies with their common eccentric diameters in desired azimuthal orientation about the mandrel axis,

said orientation means comprising:

a plurality of grooves of semi-circular cross-section extending axially in the outer periphery of the mandrel and being spaced azimuthally about the axis of the mandrel,

groove means of semi-circular cross-section extending axially in the inner periphery of each roller assembly,

said groove means in each roller assembly being adjacent a different one of said grooves in the mandrel and forming therewith a cylindrical opening, and

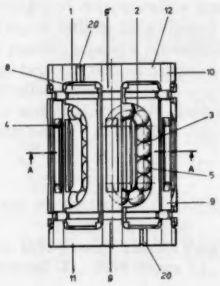
a cylindrical pin in each said opening, said pins being aximuthally spaced apart about the axis of the mandrel.

4,082,374

AXIALLY MOVABLE BEARING DEVICE

Horst Manfred Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt; Rainer Schurger, Schwanfeld; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Germany, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Filed Jul. 22, 1976, Ser. No. 707,531
Claims priority, application Germany, Aug. 16, 1975, 2536658
Int. Cl.[2] F16C *27/06*
U.S. Cl. 308—6 C **2 Claims**

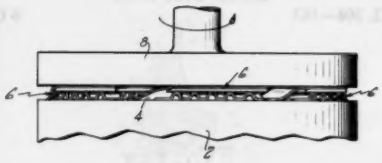


1. In an axially movable bearing including a cage having a plurality of circumferentially distributed guideways for rolling elements, each guideway including first and second axially extending channels interconnected at their ends, rolling elements in said guideways, said first channels being open radially inwardly to permit rolling elements therein to engage a shaft, and a thin-walled metal bearing housing fitted over said cage, said housing comprising (i) bridge sections aligned with said first channels, each bridge section defining a race portion engaging the rolling elements in a first channel and end portions axially beyond said race portions, (ii) slotted sections between said bridge sections through which said second channels extend radially outwardly, and (iii) means at said end portions joining said bridge sections, the improvement wherein the race portion of each bridge section has hardness substantially greater than the end portions thereof, and said end portions define a generally straight bore except for projections extending radially inward from said bore surface, said projections defining an inner diameter slightly smaller than the outer diameter of said cage, and said cage includes recesses corresponding to said projections and extending radially inward for receiving said projections, said unhardened end portions being resiliently deformable to engage said cage and recesses, whereby said housing is removably secured into said cage.

4,082,375
DUAL WEDGE FLUID THRUST BEARING INCLUDING WAVE SPRING

William E. Fortmann, West Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 17, 1976, Ser. No. 751,579
Int. Cl.[2] F16C *32/06*
U.S. Cl. 308—9 9 Claims

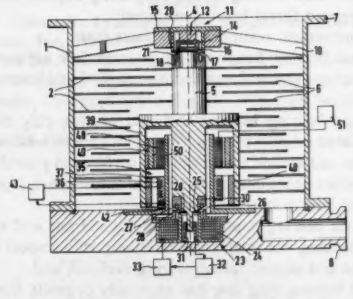


1. A thrust bearing including:
a base member having a bearing surface thereon;
a supported member above said base member and having a cooperative bearing surface spaced above the bearing surface on the base member, the members being relatively rotatable; and
a bearing insert assembly positioned between said bearing surfaces and including:
a resilient wave-shaped element resting on the first bearing surface,
a relatively thick flexible plate resting on and supported by said wave-shaped element in spaced relation to the first bearing surface, and
a relatively thin plate on said thick plate and between said thick plate and said second bearing surface, said thin plate having a leading end extending forwardly in the direction of relative rotation beyond the thick plate, and being attached at this leading end to the first bearing surface.

4,082,376
BEARING ARRANGEMENT

Heinz Wehde, Rothenberg, and Willi Becker, Braunfels, both of Germany, assignors to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar and Teldix G.m.b.H., Heidelberg, both of, Germany

Filed Dec. 4, 1975, Ser. No. 637,744
Claims priority, application Germany, Dec. 6, 1974, 2457783
Int. Cl.[2] F16C *39/00*
U.S. Cl. 308—10 20 Claims

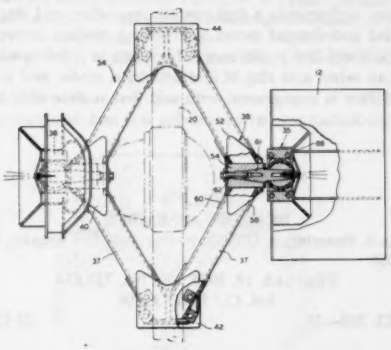


1. A device comprising: a first member; a second member disposed for rotation within, and about an axis relative to, the first member; means defining an electric motor and rotating said second member and including a motor stator on said first member; a first magnetic bearing unit composed of at least one permanent magnet mounted on one of said members and a component part of the other of said members composed at least in part of ferromagnetic material and cooperating with said permanent magnet; a second magnetic bearing unit composed of at least one actively controlled electromagnet mounted on said first member and a component part of said second member composed at least in part of ferromagnetic material and cooperating with said electromagnet; said first and second magnetic bearing units providing axial tensioning forces for said second member and having a substantially coaxial configuration to effect passive stabilization in the radial direction; a sensor disposed for sensing the axial position of said second member relative to said first member and connected to control the axial force produced by said second magnetic bearing unit; damping circuit means disposed for damping oscillations of said second member in a radial direction and including a coil mounted on said first member; wherein said second member comprises a bell-shaped portion, and said second magnetic bearing unit, said sensor, said coil of said damping circuit means and said motor stator constitute a group of components extending at least partially into said bell-shaped portion.

4,082,377
AXLE CRADLE MOUNTING HAVING ELASTOMERIC SPHERICAL BUSHINGS

Lawrence Allan Saunders, Stratford, Canada, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Sep. 24, 1976, Ser. No. 726,329
Int. Cl.[2] F16C *27/02*
U.S. Cl. 308—15 6 Claims



6. A bearing for the cradle mounting assembly of a vehicle comprising a spherical bushing having an inner race and an outer race, an elastomeric interface bonded therebetween, the elastomeric interface being pre-stressed to limit oscillation between the inner race and the outer race, and the inner race of the bushing including an outwardly extending shaft portion complementary to a bore provided in the cradle, for mounting the cradle and the bushing in assembled relation.

4,082,378
DEFORMABLE BEARING SEAT

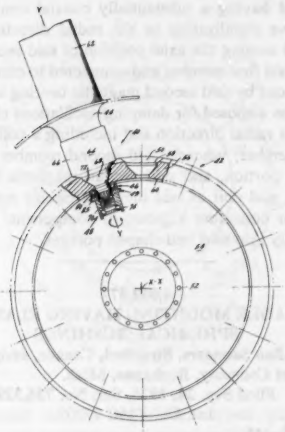
Donald A. Gries, Oregonia, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 14, 1975, Ser. No. 595,746
Int. Cl.[2] F16C *35/04, 35/06*
U.S. Cl. 308—15 9 Claims

3. In a thrust generating gas turbine engine having a blade and ring assembly mounted for rotation about a first axis, said assembly including a plurality of blades each rotatably secured to said ring for rotation about a second axis, a plurality of bearing assemblies each disposed adjacent one of said blades, means for securing said plurality of blades to said ring the combination comprising:
a deformable seating surface associated with one of said of bearing assemblies, said seating surface having a first

predetermined contour when said ring is in an undeformed mode; and

a bearing race in at least one of said bearing assemblies, said race having a first surface engaging said deformable seating surface, said seating surface in engagement with said



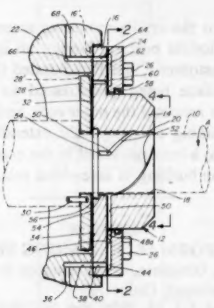
first surface over a first contact area when said ring is in said undeformed mode, said seating surface deformable from said first predetermined contour to a deformed contour when said ring is in a deformed mode, said seating surface in engagement with said first surface over a second contact area when said ring is in said deformed mode.

4,082,379

BEARING ASSEMBLY

Judson S. Swearingen, 2235 Carmelina Ave., Los Angeles, Calif. 90064

Filed Oct. 19, 1976, Ser. No. 733,874
Int. Cl.² F16C *35/08*
U.S. Cl. 308—26 **25 Claims**



1. A bearing assembly comprising:

a shaft member;

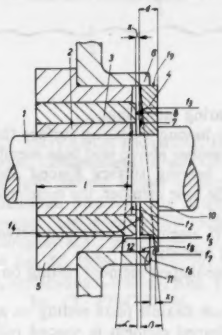
a journal bearing member having an annular journal portion receiving said shaft member for relative rotation between said two members, said journal portion and said shaft member having opposed generally cylindrical rotary bearing surfaces, and an annular flange portion extending radially outwardly from said journal portion, the effective radial rigidity of said flange portion being less than the radial rigidity of said journal portion.

4,082,380

AXIAL THRUST SLIDING BEARING FOR CENTRIFUGAL PUMPS AND COMPRESSORS

Franz Klaus, Uhlandstrasse 54, 4630 Bochum, Germany, and Franz Johann Potrykus, Bochum, Germany, assignors to said Franz Klaus, by said Franz Johann Potrykus, Bochum, Germany

Filed Sep. 2, 1976, Ser. No. 719,830
Claims priority, application Germany, Sep. 4, 1975, 2539425
Int. Cl.² F16C *17/04*
U.S. Cl. 308—163 **6 Claims**



1. In an axial thrust sliding bearing for a shaft-driven centrifugal fluid handling machine having an exterior housing, said sliding bearing having

a bearing flange carried by the exterior housing of said fluid handling machine;

a bearing support sleeve secured to said bearing flange;

a bearing bushing retained in said bearing support sleeve and secured therein against rotation, said bearing bushing having a first, radial front end thrust bearing surface; and

a bearing ring disc secured to said shaft for rotation therewith and having a second, radial thrust bearing surface for bearing against said first, radial front end thrust bearing surface, said bearing flange projecting beyond said first and second thrust bearing surfaces;

the improvement comprising the facts that;

(a) said bearing flange has an inner surface adjacent said bearing support sleeve and a portion of said bearing ring disc;

(b) said bearing bushing and said bearing ring disc are located relative to each other with a space between said first and second thrust bearing surfaces to provide non-contact accommodation of axial thrust when a pressurized fluid is introduced therein;

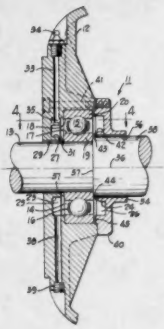
(c) said bearing support sleeve has a front end surface extending at a small angle obliquely with respect to said first and second thrust bearing surfaces; and

(d) said bearing ring disc has an axially opposite front end surface disposed outside of said second, radial thrust bearing surface, said axially opposite front end surface extending radially outwardly toward said inner surface of said bearing flange and extending at a small angle obliquely with respect to said first and second thrust bearing surfaces, said axially opposite front end surface being spaced axially beyond and away from the front end surface of the bearing flange for a portion of their circumference.

4,082,381
LUBRICATED BEARING ASSEMBLY

Frank B. Simmons, Lyndhurst; Alex Bozsvai, Solon; Louis A. Kovacs, Ashtabula, and Robert P. Gerbetz, Euclid, all of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Sep. 24, 1976, Ser. No. 726,121
Int. Cl.[2] F16C *1/24*
U.S. Cl. 308—187 18 Claims

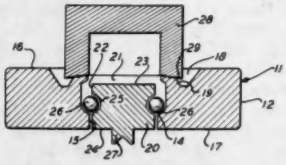


1. A lubricated bearing assembly comprising in combination,
a machine frame having an outer raceway,
a rotatable shaft having an inner raceway,
a bearing having a plurality of rollable elements disposed between and in rolling engagement with said raceways,
a first wall in said frame defining a first grease cavity on a first side of said bearing,
a second wall in said frame defining a second grease cavity on the second side of said bearing,
said first grease cavity being outboard of said second grease cavity in said machine frame,
a grease inlet passageway in said frame leading from the exterior of said frame to one of said grease cavities,
and means including vane walls defining vanes in said second cavity and including the revolution of said rollable elements for locally pressuring the grease at said vanes to move grease from said second to said first cavity.

4,082,382
METHOD FOR MANUFACTURING BALL BEARINGS; A SINTERED METAL OUTER RACE PREFORM FOR USE THEREIN; AND A BALL BEARING PRODUCED THEREBY

Nick A. Aromando, Lyndhurst, N.J., assignor to Hillside Metal Products, Inc., Newark, N.J.

Division of Ser. No. 435,683, Jan. 23, 1974, Pat. No. 4,017,951, and a continuation-in-part of Ser. No. 324,733, Jan. 18, 1973, abandoned. This application Sep. 16, 1976, Ser. No. 724,017
Int. Cl.[2] F16C *33/36*
U.S. Cl. 308—190 22 Claims

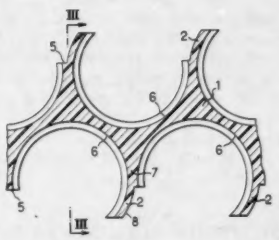


1. An annular ball bearing outer race preform having an inner annulus comprising:
(a) an integrally formed, generally annular outer race body member of molded and sintered metal powder having an annular outer face defining the rolling periphery of said bearing,
(b) an inner annular face on the outer race body member contiguous to said annulus and concentrically disposed in spaced relationship with respect to said annular outer face,
(c) radially inwardly disposed first ball bearing entrapment means on said annular inner face,
(d) a side face on the body member joining the inner and outer annular faces,
(e) a generally annular wedge-shaped flange on said face substantially concentric with the inner and outer faces,
(f) a wall on said flange straight from top to bottom, distal to said annulus extending from the side face obliquely upwards toward the said annulus, and
(g) the said flange being deformed by engagement with a deforming tool having a working face straight from side to side which tool is progressively advanced against said flange generally parallel to the axis of the annulus.

4,082,383
BALL CAGES FOR BALL BEARINGS OF THE ANGULAR CONTACT TYPE HAVING A DOUBLE ROW OF BALLS WITH OPPOSED ANGULAR CONTACTS

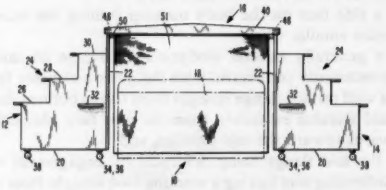
Jean Parmentier, Bagnolet; Jacques Saurais, Neuilly-sur-Seine, and Gérard Carre, Levallois-Perret, all of France, assignors to SKF Compagnie d'Applications Mecaniques, Clamart, France

Filed Dec. 2, 1976, Ser. No. 746,952
Claims priority, application France, Dec. 17, 1975, 75 38699
Int. Cl.[2] F16C *33/40*
U.S. Cl. 308—194 2 Claims



1. In a ball cage for a ball bearing of the angular contact type, said bearing including a double row of balls with opposed angular contacts, said cage permitting introduction of said balls thereinto in a direction axially of said cage and retaining said balls elastically therein and comprising a solid central portion defined between two concentric cylindrical surfaces and between two parallel planes extending perpendicular to the axis of said cylindrical surfaces, means defining cells in said solid central portion, each of said cells having a part-spherical surface for receiving one of said balls, said cells being disposed in axially directed side parts of said solid central portion, and lips projecting from said solid central portion axially beyond said parallel planes, each of said lips having a surface which forms a continuation of said part-spherical surface of one of said cells, the improvement wherein only a single one of said lips is disposed between each adjacent pair of said cells in each of said axially directed side parts, said lips in each of said axially directed side parts being similarly oriented and each lip including a base where said lip joins said central portion and means adjacent said base defining an area which lies in one of said parallel planes, said area having substantially the shape of two triangles arranged to apex with a minimum width of said area at said apices substantially midway in a radial direction of said two concentric cylindrical surfaces.

4,082,384
CASKET CANOPY
Anthony A. Dold, Richmond, Minn. 56368
Filed Jul. 19, 1976, Ser. No. 706,352
Int. Cl.² A47B *81/00*
U.S. Cl. 312—3 **6 Claims**

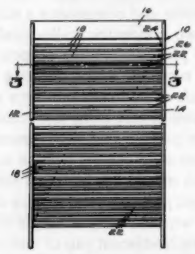


1. A casket canopy assembly for use in forming a backdrop for a casket to be displayed and for providing support surfaces for decorations to be placed about the casket, said casket canopy assembly comprising:

first and second spaced end wing units, each of said end wing units including a vertical inner wall and a tiered outer wall, each said tiered wall having a plurality of horizontal support shelves extending outwardly from said tiered wall perpendicularly to said inner wall, each said inner wall including an upper portion extending above an uppermost one of said horizontal shelves, each of said end wing units further including casters secured to a base portion thereof; and

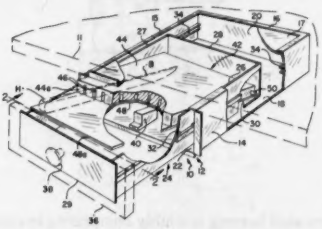
a horizontal, elongated top, said top including first and second top halves, a first end of each of said top halves being secured to said upper portion of said vertical inner wall of one of said end wing units, said top halves extending perpendicularly inwardly from said vertical inner walls of said end wing units and having second end portions adjacent each other when said casket canopy assembly is in use, said vertical inner walls and said horizontal top halves cooperating to form an enclosure within which the casket is placed during use of said casket canopy assembly, said spaced end wing units being positioned at opposed ends of said casket with said vertical inner walls being parallel to each other and to the ends of said casket.

4,082,385
RECORD ALBUM FILING CABINET
James V. Morrone, 16 Forrest St., Winthrop, Mass. 02152
Filed Apr. 19, 1972, Ser. No. 245,435
Int. Cl.² A47B *81/06*
U.S. Cl. 312—10 **5 Claims**



1. A cabinet for filing folders containing phonograph records which comprises a body having side walls and a top wall, and a plurality of shelves secured between the side walls in spaced relation to each other a distance apart slightly greater than the record folder to be filed, each of said shelves having an extended tab portion along the front edge, each tab from top to bottom being of slightly greater width than the preceding tab; a plurality of folders, each of said folders having a cutout portion along one edge slightly greater in length than the width of a tab on a particular shelf whereby a folder presented to the cabinet for filing will fall onto an adjacent shelf wherein the length of the cutout portion is less than the width of the tab on that shelf, thus each folder may be returned to its proper shelf after use.

4,082,386
DRAWER FOR KNIVES AND OTHER UTENSILS AND TOOLS
Onan S. Beasley, Jr., Rte. 2, Box 1823, Madras, Oreg. 97741
Filed Jul. 1, 1976, Ser. No. 701,589
Int. Cl.² A47B *97/00*
U.S. Cl. 312—204 **10 Claims**



1. A drawer assembly comprising:

a drawer casing means defining a drawer-receiving space with a front opening into said space,

a stationary riser means extending upwardly from said casing into said space,

a drawer adapted to be slidably received within said space through said front opening, said drawer including a front, a back, a top access opening and a bottom opening enabling said riser means to extend upwardly into said drawer when said drawer is both opened and closed,

a holder means within said drawer for the retention of selected items, said holder means being pivoted to said drawer rearwardly and below the top of said riser means for vertical movement about a pivot axis transverse to the direction of sliding movement of the drawer,

said holder means being supported forwardly of said pivot axis at an inclination within said drawer on said riser means in both the open and closed position of the said drawer such that when said drawer is closed, said holder means lies wholly within said drawer space and when said drawer is opened, a forward free end of said holder means lies outwardly of said front opening and projects upwardly toward the top access opening of said drawer to provide ready access to the items within said holder means.

4,082,387
VEHICLE CONSOLE FOR MOUNTING AND ENCLOSING RADIOS AND THE LIKE
Thomas R. Davis, 600 S. 45th St., Lincoln, Nebr. 68510
Filed Aug. 19, 1976, Ser. No. 715,766
Int. Cl.² A47B *67/02*; B60R *7/00*
U.S. Cl. 312—242 **22 Claims**

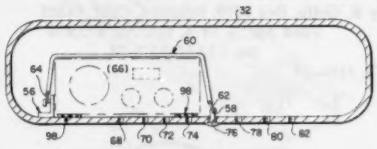
1. A vehicle console for mounting and enclosing radios and the like, comprising:

A. a vertically extending bracket having a lower flange surface for mounting upon a vehicle surface, said flange including a plurality of apertures for receiving a vehicle mounting means; and

B. a bracket extension upwardly extending from said vertically extending bracket, said extension being pivotably mounted to said bracket for an angular positioning of said extension about a horizontal axis; and

C. a housing for enclosing a radio and the like rigidly mounted to an upper surface of said bracket extension wherein said housing further comprises a closed box-like enclosure having a frontwardly facing access opening coverable by an access door, said door being downwardly pivotable upon a horizontally disposed hinge, said door including a lock means operable for maintaining the interior of said enclosure closed against unauthorized entry; and

D. means within the interior of said enclosure operable for mounting radios and the like, having frontwardly present-



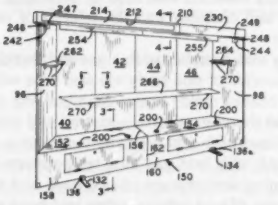
ing control panels, therewithin, said mounting means being adapted to maintain said radio resiliently in contact with said housing interior through an elastomeric spacer between the bottom of said radio and the lower interior surface of said enclosure, wherein said radio mounting means further comprises a fixed anchor proximate one side of said enclosure interior, a movable anchor means operable to be adjustably spaced from said fixed anchor, and an elastomeric strap operable to extend from said fixed anchor, over said radio, to said movable anchor means.

4,082,388

COLLAPSIBLE DISPLAY BOOTH

Roy F. Goeglein, 3102 E. Maple Grove Ave., Fort Wayne, Ind. 46806

Filed Nov. 17, 1976, Ser. No. 742,692
Int. Cl.[2] A47B *43/00*
U.S. Cl. 312—258 **13 Claims**



1. A collapsible booth comprising:

a plurality of transversely alignable elongate wall sections and having longitudinal edges of adjacent sections in abutting relation; a hinge member being connected between each of the abutting longitudinal edges;

each of said wall sections having upper and lower transverse edges; the respective upper transverse edges being in horizontal alignment and the respective lower transverse edges being in horizontal alignment;

an elongate channel having a U-shaped cross-section removably fitted over at least one of the upper and lower transverse edges of the wall section for supporting said wall sections in a predetermined transverse alignment;

at least one elongate stabilizer being removably fitted to a lower transverse edge and extending substantially orthogonally therefrom;

a plurality of elongate supports removably attachable to said wall sections and orthogonally projecting a predetermined distance therefrom;

a planar elongate cabinet top layable over said supports in supported orthogonal relation to said wall sections;

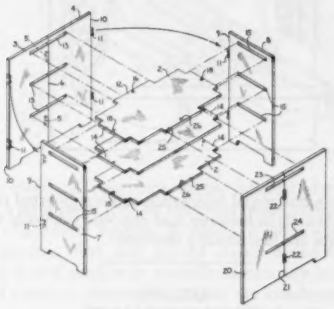
an elongate planar cabinet front having vertically spaced upper and lower longitudinal edges, said front removably fitted to said stabilizer at a lower longitudinal edge of said front and to said top at the upper longitudinal edge of said front.

4,082,389

COLLAPSIBLE CAMP SUPPLY UNIT

Glenn M. Stewart, 2929 Blakeley Ave., Eau Claire, Wis. 54701

Filed Jan. 28, 1977, Ser. No. 763,370
Int. Cl.[2] A47B *43/00, 48/00*
U.S. Cl. 312—258 **3 Claims**



1. A collapsible camp supply unit comprising four rigid rectangular panels of substantially equal height and substantially equal width, hinges joining two of said panels together along adjacent vertical edges to provide a planular back for the unit with said joint foldable frontward, the other two panels constituting end panels for the unit extending forwardly from the opposite side edges of said planular back, hinges joining the rear vertical edge of each end panel to the corresponding adjacent side edge of said back to provide for folding of said end panel inwardly against the corresponding adjacent back panel, a plurality of separate vertically spaced horizontal shelves having edge tenons extending through corresponding individual slots in said back and end panels, and removable pins extending through said tenons on the outside of said unit to secure the said panels and shelves rigidly together to provide a storage unit, said last named hinges additionally providing for outward movement of said end panels when said pins are removed to release said tenons for ready removal of said shelves and subsequent folding of said panels upon one another.

4,082,390

CONVERTIBLE TRAY CABINET

David L. Gibson, Newark, N.Y.; Lawrence J. Barrett, Glenside, Pa.; Patricia A. Moore, New York, N.Y., and David R. Butler, Westport, Conn., assignors to C. H. Stuart Inc., Newark, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,285
Int. Cl.[2] B65D *25/12*
U.S. Cl. 312—284 **31 Claims**

1. A convertible tray cabinet comprising:

(a) a lid including four sidewalls and a top wall and enclosing a tray compartment inside of said lid,

(b) a base including four sidewalls, a bottom wall, and means for supporting said lid thereon,

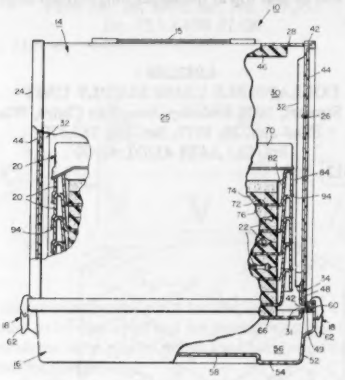
(c) means for releasably connecting said lid to said base,

(d) a plurality of trays stacked on top of each other in said tray compartment with each tray being in a horizontal orientation,

(e) said lid including a plurality of spaced-apart, vertical ribs extending inwardly from the inside surfaces of two opposite sidewalls, and

(f) each tray including means for slidably supporting the tray

on a pair of opposed ones of said ribs when said lid is placed on its side by being moved from a vertical orientation to a horizontal orientation and is supported on one of the sidewalls in-between said opposite sidewalls whereby said ribs are horizontally oriented.

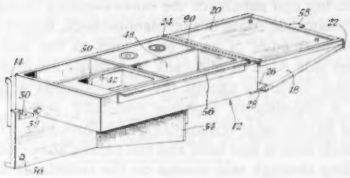


4,082,391

STOWABLE GALLEY

Roland P. Turner, 2600 S. Kanner Hwy., Apt. N1, Stuart, Fla. 33494

Filed Dec. 15, 1976, Ser. No. 750,612
Int. Cl.[2] A47B 77/10
U.S. Cl. 312—314 **6 Claims**



1. A stowable galley moveable from a first horizontal, operational position to a second stowed vertical position for increasing the utilization of living space in a relatively confined area comprising:

a rigid receptacle having a height substantially less than its width;

a first pivotal receptacle mounting means connected on one side of said receptacle for pivotally connecting said receptacle to a supporting surface, said receptacle pivotal from a horizontal to a vertical position;

a receptacle closure pivotally connected to said receptacle;

a pivotal connecting means connected to one end of said receptacle and to one end of said closure;

a means for supporting said receptacle in a horizontal position connected to said receptacle;

a closure supporting means connected to one side of said receptacle and to said pivotal closure whereby said pivotal closure is moveable to an extended horizontal position beyond the end of said receptacle providing a counter top surface outside of said receptacle;

said pivotal closure including a first panel and a second panel;

a hinge means connected to said first panel and said second panel, the first panel pivotally movable relative to said second panel, said first and second panels moveable relative to said receptacle to form a counter top over one portion of said receptacle;

a sink disposed within said receptacle;

a rotatable spigot coupled within said sink, said spigot rotatable from an up position to a down position within said sink;

said pivotal supporting means including a rigid flange coupled to one edge of said receptacle; and

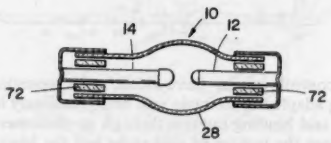
a rigid lip connected to one end of said first panel of said pivotal closure, said lip engageable with said rigid edge flange to support said second panel in a horizontal position providing a counter top outside of said receptacle.

4,082,392

GAS DISCHARGE LAMP PREPARATION PROCESS

Jeffrey R. Golin, Box 9959, Stanford, Calif. 94305

Filed Apr. 5, 1976, Ser. No. 673,476
Int. Cl.[2] H01J 9/38
U.S. Cl. 316—19 **8 Claims**



1. A process for sealing a gas within an electronic tube such as a gas discharge lamp, comprising:

providing within a gas tight chamber which includes heating means, a hollow axially extending vitreous body having a vitreous tube integral with said body extending along said axis to an orifice, said hollow vitreous body further including a pair of electrodes extending axially thereinto a respective one of which extends through said tube, is not sealed thereto and has a vitreous bead in the form of a sleeve about said respective electrode in said tube formulated of a solder type of glass, said bead having a softening temperature below a softening temperature of said tube, said bead allowing gas transfer through said first tube to the interior of said body and having the ability to wet, seal and thereby close off said tube on softening;

evacuating said chamber and the interior of said body via said tube;

pressurizing said chamber with a gas and thereby pressurizing the interior of said body via said tube with said gas;

uniformly heating said entire chamber via said heating means and thereby uniformly heating said tube, said body and said bead with said tube and the interior of said body pressurized with said gas to a temperature intermediate the softening temperature of said bead and the softening temperature of said tube to soften said bead and wet, seal and thereby close off said tube therewith while sealing said bead to said respective electrode;

cooling said sealed body, tube and electrodes.

4,082,393

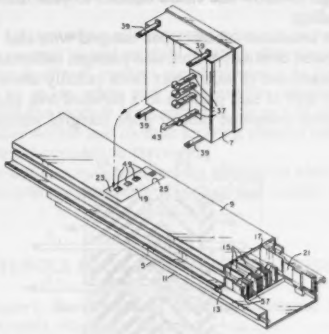
BUS DUCT ASSEMBLY

Dennis H. Gamble, Brighton Township, Beaver County, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 27, 1977, Ser. No. 763,201
Int. Cl.[2] H01R 3/06
U.S. Cl. 339—14 R **3 Claims**

1. A bus duct assembly comprising a bus duct section having top and bottom walls and opposite side walls forming a housing, a plurality of multi-phase bus bars supported within the housing, a ground bar within the housing and adjacent to one side wall and substantially coextensive with the housing, means for retaining the ground bar in place against the side wall comprising a pair of reinforcement inturned ribs in said side wall, the ground bar being located between the ribs, the ground bar comprising an offset end portion, and a retaining

bracket secured on said wall and overlapping the offset end portion for holding an end portion of a ground bar of an adja-



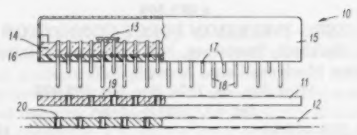
cent bus duct between the offset end portion and the side wall of the bus duct.

4,082,394

METALLIZED CERAMIC AND PRINTED CIRCUIT MODULE

Ronald Walker Gedney, Endicott, and Robert Richard Rodite, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,227
Int. Cl.² H05K *1/12*
U.S. Cl. 339—17 M **1 Claim**



1. A metallized ceramic and printed circuit module which comprises:

a plurality of integrated circuit chips;

a metallized circuit ceramic substrate on which said chips are mounted with one layer of circuit lines on the surface of said substrate being connected to said chips, the number of interconnections between said circuit lines and chips being limited because no two of said circuit lines can cross;

a plurality of I/O pins arranged on a closely spaced pin grid to provide a high I/O pin density and which pins are staggered in height to provide short pins and relatively longer pins;

a multilayer organic printed circuit carrier having a plurality of signal, ground and voltage planes and having plated thru holes connected to said planes and arranged on a pin grid corresponding to the pin grid of said module and into which said pins are plugged with said longer pins protruding out the other side of the carrier and said shorter pins ending with said carrer, said high I/O pin density allowing multichip wiring to provide said multilayer carrier with ample wireability for multichip applications, said interconnections between said short pins compensating for the lack of crossover ability in the layer of circuit lines on said ceramic substrate; and

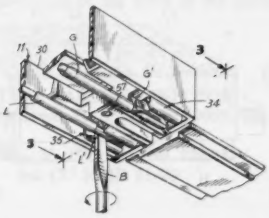
a printed circuit card having plated thru holes arranged on a low I/O pin density grid corresponding to only that of said longer pins and into which said longer pins are plugged to connect with circuitry thereon.

4,082,395

LIGHT TRACK DEVICE WITH CONNECTOR MODULE

Anthony C. Donato, Westfield, and Neil Russo, Jersey City, both of N.J., assignors to Lightolier Incorporated, Jersey City, N.J.

Filed Feb. 22, 1977, Ser. No. 770,388
Int. Cl.² H01R *9/12*
U.S. Cl. 339—21 R **6 Claims**



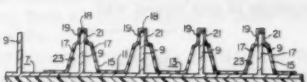
1. An electrical connector fixture adapted electrically to connect a light track with an electrical mains supply comprising an attachment module including a downwardly open mouth portion, first and second mains connector clamps mounted in said module in mutually electrically isolated relation and coupled, respectively, with the conductors of said light track, each said clamp being formed of resilient conductive material and comprising a base, a spaced pair of legs extending from each base, each said leg terminating in an inturned ledge portion overlying a portion of its base, said ledge portions terminating in distal edges spaced to define downwardly open elongate entry slots therebetween, said distal edges being inclined toward said bases, a spring retainer tab member formed integrally with each base, said tab members being directed toward said ledges and terminating in retainer edges spaced from said ledges a distance less than the thickness of a said mains lead, and cam means formed on said tab members and inclined in the direction of said entry and toward said base slots, to deflect said tab members toward said bases responsive to lateral forces exerted against said cam means by mains leads, whereby said leads are resiliently clamped between said ledges and tab members.

4,082,396

SHIELD FOR BUS BAR STABS

Kenneth R. Coley, Fairfield, and George M. Carris, Monroe, both of Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1977, Ser. No. 773,096
Int. Cl.² H01R *13/44*
U.S. Cl. 339—36 **7 Claims**



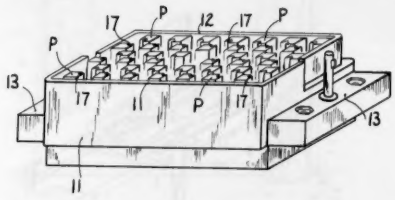
1. A shield for stabs of a loadcenter bus bar comprising a formed sheet-like member having spaced blisters extending from one side of the member, the blisters having spacings approximately equal to the spacing between the stabs of a loadcenter, each blister having dimensions sufficient to enclose a corresponding stab, and retaining means for retaining the member in place on the bus bar and stabs and comprising a blister end portion having a reduced cross section detachably clamplingly engaging an outer end portion of the stab.

4,082,397

HERMAPHRODITE HOUSING ASSEMBLY

Michiaki Tanaka, Sagamihara, and Yoshimasa Nonaka, Musashino, both of Japan, assignors to Kabushiki Kaisha Elco International, Yokohama, Japan

Filed Feb. 25, 1977, Ser. No. 772,060
Claims priority, application Japan, Sep. 21, 1976, 51-112499
Int. Cl.[2] H01R *25/02*
U.S. Cl. 339—49 R 3 Claims



1. A hermaphrodite housing assembly, the housing being made of an insulation material formed in a substantially rectangular configuration, said housing including,

a body portion having a flat base,

a first wall, having thickness and extending above said flat base, said first wall aligned with the edge of said flat base and forming one side of said body and half of the sides of said body adjacent to said one side, said flat base abutting the inside of said first wall,

a second wall, having thickness and extending above said flat base, said second wall recessed from the edge of said flat base at least the thickness of said first wall and forming the opposite side of said body from said one side and forming half of the sides of said body adjacent to said opposite side, said flat base extending outside the base of said second wall substantially the same distance from said second wall as the thickness of said first wall, said flat base, said first wall and said second wall combining for forming a receptical,

first shoulder means extending out from and along one of the sides of said body, in a plane parallel to said flat base,

pin means supported by said first shoulder and centrally positioned on said first shoulder and extending above said flat base,

second shoulder means extending out from and along the side opposite said one of the sides and said body in plane parallel to said flat base,

hole means located in said second shoulder and positioned for receiving and locating said pin means when one housing assembly is mated with another such housing assembly,

a plurality of pairs of projections extending from said flat base providing a matrix of projections,

one projection of each pair of projections positioned adjacent said second wall abutting said second wall and,

one projection of each pair of projections positioned adjacent said first wall displaced from said first wall at least the thickness of said second wall.

4,082,398

ELECTRICAL CONNECTOR WITH FRONT AND REAR INSERTABLE AND REMOVABLE CONTACTS

Normand C. Bourdon; Richard Sanford, both of Sidney, N.Y., and Raymond J. Eifler, Farmington, Mich., assignors to The Bendix Corporation, Southfield, Mich.

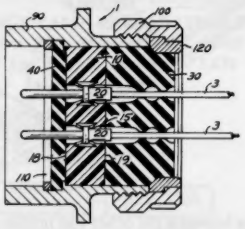
Filed Oct. 1, 1976, Ser. No. 728,820
Int. Cl.[2] H01R *9/16*
U.S. Cl. 339—59 M 12 Claims

3. An electrical connector insert comprising:

a body of molded dielectric material having a plurality of passages therethrough from a front face to a rear face for receiving a contact, each passage including a first portion deformable to a size at least large enough to allow the entire contact to pass therethrough, and the remaining portion of said passage through its length at least large enough to allow the entire contact to pass therethrough, including:

a first truncated tubular cone integral with said body and located coaxially within said passage, said cone tapering toward one of said insert faces radially inwardly from the wall of said passage to a forward free end; and

a second truncated tubular cone integral with said body



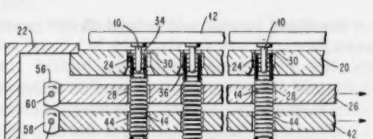
and located coaxially within said passage, said second cone tapering toward the other of said insert faces radially inwardly from the wall of said passage to a foward free end which terminates a predetermined distance from the free end of said first tubular cone, said first and second cones being resiliently deformable to at least large enough to allow the contact to pass therethrough and substantially rigid in a size less than large enough to allow the contact to pass therethrough in an axial direction when in their nonexpanded position.

4,082,399

ZERO-INSERTION FORCE CONNECTOR

Earl D. Barkhuff, Staatsburg, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 23, 1976, Ser. No. 698,972
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—75 M 10 Claims



1. A zero-insertion force connector for a multi-pin module comprising:

a plurality of short, narrow, resilient conductive contact members each having a longitudinal axis coaxial with a lengthwise opening therethrough of a diameter slightly greater than said pin so as to each receive a pin of a module with substantially zero friction;

a module locating plate located in a first plane and having a plurality of openings therein extending thru said plate perpendicular to the plane thereof, each opening containing an end of one of said contact members which extend coaxially beyond said openings from the same side of said module locating plate and each opening centered with respect to one of said pin positions and having a diameter somewhat larger than said contact member so the end of said contact member can move radially therein to adjust for pin misalignment;

an actuator plate located parallel to the plane of and adjacent the side of said module locating plate from which said

contact members extend and contacting each of said contact members so as to provide in its actuated condition bending along the longitudinal axis of said contact members,

means for actuating said actuator plate to move laterally with respect to said module locating plate thereby bending each of said contact members along its longitudinal axis so as to wipe and substantially circumferentially contact the module pin inserted in the end of said contact member within said module locating plate to make a good electrical connection therewith;

and fan-out connection means for making an electrical connection to the other end of each of said contact members.

4,082,400

MULTI-POLE PLUG-AND-SOCKET CONNECTING ARRANGEMENT

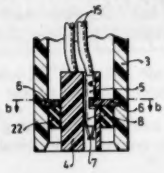
Willi Gansert, Kornwestheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 517,094, Oct. 22, 1974, abandoned. This application Oct. 12, 1976, Ser. No. 731,503

Claims priority, application Germany, Nov. 2, 1973, 2354795

Int. Cl.[2] H01R *13/40, 13/54*

U.S. Cl. 339—91 R **16 Claims**



1. A multi-pole connecting arrangement comprising, in combination, a plug connector provided with a plurality of electrical contacts arranged in at least one row, a socket connector provided with a plurality of electrical contacts arranged in at least one row corresponding to the electrical contacts of said plug connector; a mounting hook on one of said connectors and a cooperating holding portion on the other of said connectors, said mounting hook being hooked behind said holding portion for swinging movement of said plug connector relative to said socket connector from a first to a second position, said first position being a position in which not all of the contacts of said socket connector are in electrical engagement with the corresponding contacts of said plug connector, said second position being a position in which all of the contacts of said socket connector are in electrical engagement with the corresponding contacts of said plug connector, and said mounting hook and said holding portion being disconnectable from each other to permit disconnection of said plug connector from said socket connector; and a snap-latch on one of said connectors and a cooperating catch on the other of said connectors, said snap-latch and catch being so positioned that said snap-latch engages said catch with a snap action only when said plug connector is swung from said first position to said second position, and wherein said plug connector includes means securing the contacts of said plug connector in position on said plug connector, the securing means including a holding member discrete from the remainder of the plug connector, the contacts of the row of contacts of the plug connector being positioned and caused to form a row by said holding member, and said holding member being in turn positioned on and supported by the remainder of the plug connector, said holding member being a comb-shaped member having a row of comb teeth, the comb teeth of the holding member gripping behind respective ones of the row of electrical contacts of said plug connector, the holding member having ends which extend transversely of the direction in which the comb teeth row extends, said ends being located interiorly of and being confined by the adjoining portions of the plug connector, said adjoining portions of the plug connector preventing shifting of the comb-shaped holding member in the direction in which the comb teeth row extends, said comb-shaped holding member having a longitudinal edge running along the side of the holding member opposite to the side provided with the comb teeth, the remainder of the plug connector being provided with a longitudinal groove into which the said longitudinal edge can be inserted and held if and only if all the individual contacts secured by the holding member are properly positioned relative to the respective ones of the teeth of the comb-shaped holding member.

4,082,401

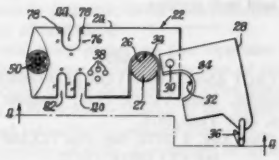
BATTERY CABLE CONNECTOR

Steve Kruszecki, Jefferson St., P.O. Box 30055, Chicago, Ill. 60630

Filed Sep. 20, 1976, Ser. No. 725,022

Int. Cl.[2] H01R *11/20*

U.S. Cl. 339—95 B **7 Claims**



1. A battery cable connector, comprising,

a main plate having a notch in one edge thereof,

a clamping plate pivotally mounted on the main plate and also having a notch in one edge thereof,

the clamping plate being swingable on the main plate between an open position in which the notch in the main plate is open and adapted to receive a binding post in position therein, and a closed position in which the notches are in register and form a closed hole surrounding a binding post so positioned,

releasable interlocking means between the plates for bringing them into tight contact engagement with the binding post,

the main plate having secondary open notches for selectively receiving a binding post, and adapted for securement with the binding post by nut means, and

the main plate having means for connecting the connector with a cable.

4,082,402

FLAT FLEXIBLE CABLE TERMINAL AND ELECTRICAL CONNECTION

Robert John Kinkaid, New Cumberland, and John Carl Asick, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 432,112, Jan. 9, 1974, abandoned. This application Jan. 6, 1975, Ser. No. 539,128

Int. Cl.[2] H01R *11/20*

U.S. Cl. 339—97 C **11 Claims**

8. An electrical terminal adapted to be connected in gripped relationship with a flat elongated conductor, comprising:

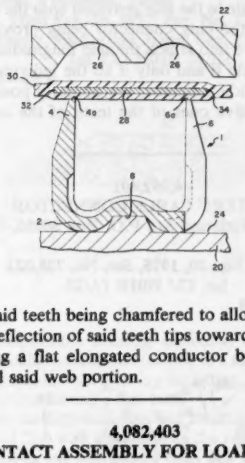
a web portion having a first pair of teeth projecting from one side of said web portion and a second pair of teeth projecting from an opposite side of said web portion,

each of said pairs of teeth being bent outwardly of the plane of said web portion and defining an initial space separating said first and second pairs of teeth,

each of said teeth being wedge-shaped and defining wedged-shaped clearances between adjacent teeth,

each of said teeth having sharp slicing edges adjacent corresponding wedge-shaped clearances,

each of said teeth having a rounded and sharpened tip, and



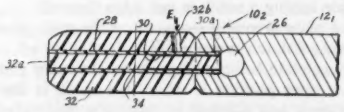
each of said teeth being chamfered to allow curling thereof upon deflection of said teeth tips toward said web portion pinching a flat elongated conductor between said teeth tips and said web portion.

4,082,403

MALE CONTACT ASSEMBLY FOR LOADBREAK USAGE

David E. Bressler, Long Valley, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,386
Int. Cl.² H01R *13/52*
U.S. Cl. 339—111 **9 Claims**



1. A male contact assembly comprising:

(a) an elongate male contact of electrically conductive material;

(b) an electrically insulative member secured to said male contact and extending longitudinally therefrom, said insulative member defining a hollow interior extending at least partly therewith;

(c) electrically conductive means in said insulative member interior and connected to said male contact for electrically longitudinally extending said male contact; and

(d) a longitudinally extending layer overlying said insulative member and comprised of material generating arc-extinguishing gases upon exposure to electrical arcing, the longitudinal extent of said layer being greater than the longitudinal extent of said electrically conductive means in said insulative member.

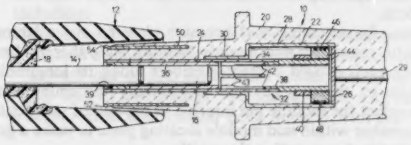
4,082,404

NOSE SHIELD FOR A GAS ACTUATED HIGH VOLTAGE BUSHING

Richard P. Flatt, Oconomowoc, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Nov. 3, 1976, Ser. No. 738,741
Int. Cl.² H01R *13/52*
U.S. Cl. 339—111 **8 Claims**

1. A high voltage bushing for terminating a high voltage cable having a cable terminator connected thereto, the terminator including a probe and a conductive insert, the bushing comprising a housing having an elongated bore and a bore contact movable in the bore in the housing and a nose shield comprising an electrically conductive member embedded within and surrounding the open end of the bore in the bushing, said member being partially exposed at one end for engagement with the conductive insert of the terminator on close-in of the probe with the bore contact in the bushing.

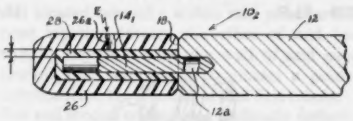


4,082,405

LOADBREAK MALE CONTACT ASSEMBLY

Frank M. Stepniak, Long Valley, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,387
Int. Cl.² H01R *13/52*
U.S. Cl. 339—111 **10 Claims**



1. A male contact assembly comprising:

(a) an elongate male contact of electrically conductive material;

(b) an electrically conductive member secured to said male contact and extending longitudinally therefrom;

(c) an outer layer comprised of material generating arc-extinguishing gases upon exposure to electrical arcing; and

(d) an intermediate layer situate between said conductive member and said outer layer of greater resiliency than said outer layer; and

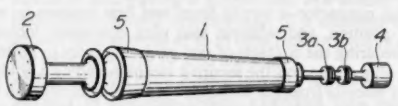
(e) wherein said outer layer extends longitudinally beyond said male contact to a greater extent than said intermediate layer.

4,082,406

METHOD AND APPARATUS FOR CONNECTING LEADS OF A ROTOR

Hiroyuki Kamiya, Hitachi; Ken Takahashi, Tokaimura; Seiji Watanabe, and Tomohisa Kanazawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 3, 1976, Ser. No. 738,368
Claims priority, application Japan, Nov. 15, 1975, 50-137632
Int. Cl.² H01R *13/00*
U.S. Cl. 339—112 L **7 Claims**



1. A method for connecting leads of a rotor wherein hollow axial leads each inserted in an axially extending bore in a rotary shaft for permitting a cooling medium to flow therethrough are electrically and mechanically connected to respective hollow radial leads each inserted in a bore extending radially of said rotary shaft from said axially extending bore for permitting the cooling medium to flow therethrough, comprising the steps of:

inserting a cooling medium sealing pipe in said radially

extending bore and joining the same at one end thereof to one of said axial leads inserted in said axially extending bore before one of the hollow radial leads and an insulating pipe are inserted in said radially extending bore;

fitting said hollow radial lead over the outer periphery of said cooling medium sealing pipe; and

joining the cooling medium sealing pipe at the other end thereof to said hollow radial lead.

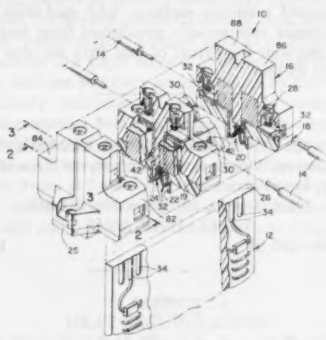
2. In an apparatus for connecting leads of a rotor wherein hollow axial leads each inserted in an axially extending bore in a rotary shaft for permitting a cooling medium to flow therethrough are electrically and mechanically connected to respective hollow radial leads each inserted in a bore extending radially of said rotary shaft from said axially extending bore for permitting the cooling medium to flow therethrough, the improvement comprising a cooling medium sealing pipe inserted in said radially extending bore and joined at one end thereof to one of said hollow axial leads and at the other end thereof to one of said hollow radial leads fitted over the outer periphery of said cooling medium sealing pipe.

4,082,407

TERMINAL BLOCK WITH ENCAPSULATED HEAT SINK

Adam Smorzaniuk, West Millington, and Paul F. Lindlau, East Orange, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 798,900
Int. Cl.² H01R *13/00*
U.S. Cl. 339—112 R **16 Claims**



1. An electrical connector for serving as an interface between a circuit panel and a plurality of external conductors comprising:

(a) a body member of electrically insulative material having an elongated socket for receiving an edge of a circuit panel therein;

(b) at least one longitudinally extending thermally conductive member disposed in a recess in said body and being entirely surrounded by the electrically insulative material of said body;

(c) a plurality of electrical connected members in said body for receiving a corresponding plurality of external conductors;

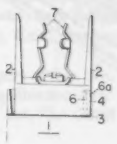
(d) a like plurality of electrical contact elements, each of said contact elements being situate in said body member such that a first portion of each one of said contact elements extends into said socket to engage a terminal on a circuit panel inserted into said socket, a second portion engages said thermally conductive member for transferring heat into and away from said thermally conductive member, and a third portion engages a corresponding one of said plurality of electrical connector members.

4,082,408

ELECTRIC FUSE HOLDER

John G. Angelis, Hampton, N.H., assignor to Gould, Inc., Newburyport, Mass.

Filed Feb. 24, 1977, Ser. No. 771,816
Int. Cl.² H01R *9/22*
U.S. Cl. 339—198 G **7 Claims**



1. A modular fuse holder unit comprising

a. a substantially prismatic block of a synthetic resin supporting a pair of fuse clips;

b. said block being planar on two opposite sides thereof except for a planar projection on one of said sides and a planar recess on the other of said sides, both said projection and said recess beginning at the lower edge of said block and extending in upward direction;

c. said projection slightly converging in upward direction and defining a first pair of grooves on both lateral sides thereof whose depth slightly increases in upward direction and are bounded by a first pair of ribs whose thickness slightly decreases in upward direction;

d. said recess slightly converging in upward direction and defining a second pair of grooves on both lateral sides thereof whose depth slightly decreases in upward direction and are bounded by a second pair of ribs whose thickness slightly increases in upward direction; and

e. said projection and said first pair of grooves and said recess and said second pair of grooves being complementary positives and negatives whereby said block is capable of being joined under wedge pressure with other identical blocks by engagement of said recess in one of said blocks by said projection in another of said blocks and by engagement of said second pair of grooves in one of said blocks by said first pair of ribs in another of said blocks.

4,082,409

ELECTRICAL COUPLER AND ADAPTER

James R. Bailey, Chicago, and Vernon W. Lavigne, Rolling Meadows, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Filed Feb. 18, 1977, Ser. No. 769,851
Int. Cl.² H01R *17/18*
U.S. Cl. 339—182 R **7 Claims**

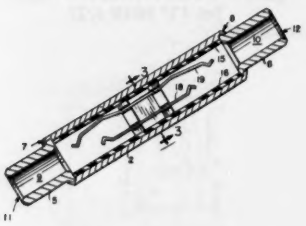
1. An electrical coupler and adapter for electrical plugs of the tip and ring type comprising:

(a) an elongated electrically conducting tubular sleeve having opposing open ends,

(b) opposing electrically conducting bushings mounted in said opposing ends of (a), said bushings each having an opening therein to receive an electrical plug of the tip and ring type,

(c) a pair of complemental semi-tubular electrically insulating inserts disposed inside an intermediate portion of said sleeve and extending lengthwise between said bushings, said inserts having mounting means to hold vertically between them one or more resilient electrically conducting flat elongated contacting members portions of which are shaped to contact the tip or ring of an electrical plug of the tip and ring type, and

(d) one or more resilient electrically conducting flat elongated contacting members having central portions thereof mounted vertically in said mounting means of (c) and



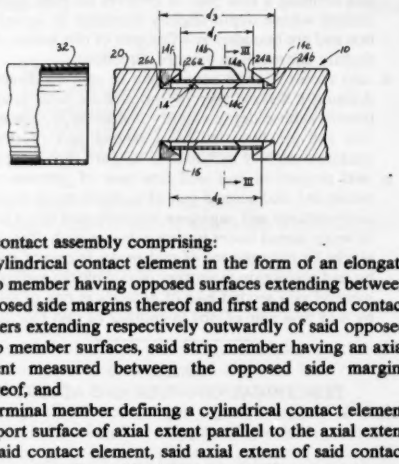
having opposing end portions shaped to contact the tip or ring of an electrical plug of the tip and ring type when said plug is inserted into said opening in said bushing of (b).

4,082,410

ELECTRICAL CONNECTORS AND CONTACT ASSEMBLIES THEREFOR

Glenn E. Storck, Long Valley, and Andrew A. Kominiak, Flanders, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed May 6, 1976, Ser. No. 683,881
Int. Cl.² H01R *13/06*
U.S. Cl. 339—252 R **10 Claims**



1. A contact assembly comprising:

a. a cylindrical contact element in the form of an elongate strip member having opposed surfaces extending between opposed side margins thereof and first and second contact fingers extending respectively outwardly of said opposed strip member surfaces, said strip member having an axial extent measured between the opposed side margins thereof, and

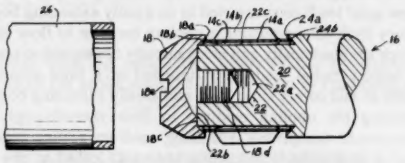
b. a terminal member defining a cylindrical contact element support surface of axial extent parallel to the axial extent of said contact element, said axial extent of said contact surface exceeding said axial extent of said contact element, said terminal member having a pair of circumferentially extending, contact element retention surfaces juxtaposed with said support surface respectively, said surfaces having respective axially facing ends spaced apart by a distance less than said axial extent of said contact element, and at least a pair of axially spaced and aligned passages extending respectively through said circumferentially extending retention surfaces, the spacing between axially distal ends of said passages exceeding said axial extent of said contact element, and wherein said passages provide entry means through which said elongate strip member may be inserted into engagement between said contact element retention surfaces and said support surface without causing distortion of said strip member and with said first contact fingers engaging said support surface and said opposed strip member side margins engaging said retention surfaces.

4,082,411

ELECTRICAL CONNECTORS AND CONTACT ASSEMBLIES THEREOF

Glenn E. Storck, Long Valley, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed May 6, 1976, Ser. No. 683,842
Int. Cl.² H01R *13/06*
U.S. Cl. 339—252 R **13 Claims**



1. An electrical contact assembly having a terminal member defining a contact element support surface and a contact element engagingly supported thereby, said contact element comprising a strip member having opposed surfaces extending between margins of said strip member and first and second contact fingers extending respectively angularly outwardly of said opposed surfaces of said strip member, said first contact fingers engaging said contact element support surface, said terminal member having first and second releasably engaged parts defining first and second retention surfaces respectively engaging said strip member margins and means for providing predetermined spacing between said first and second retention surfaces whereby such engagement of said first contact fingers and said contact element support surface is maintained by said first and second retention surfaces, with said strip member being maintained substantially equidistant from said support surface throughout the extent of said strip member between said margins thereof.

4,082,412

MALE AND FEMALE TERMINAL COMBINATION

David C. Lennon, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Dec. 29, 1975, Ser. No. 645,043
Int. Cl.² H01R *13/12*
U.S. Cl. 339—256 SP **12 Claims**

1. The combination comprising a spade male terminal, a female terminal for receiving in electrical contacting engagement said spade male terminal in any diametral position thereof, said female terminal including a strip of electrical conductive material having a distal portion integral with another generally planar portion, said distal portion having a generally cylindric section deformed with respect to said another portion so as to be disposed generally laterally thereof and defining at least in part a bore extending generally crosswise of said strip for the electrical contacting engagement with said male terminal, and a free end on said distal portion terminating said strip including a beveled surface predeterminately placed in at least closely adjacent relation with respect to said

another portion so that said spade male terminal is received in the any diametral position thereof across said bore in the electrical contacting engagement therewith.

4,082,413

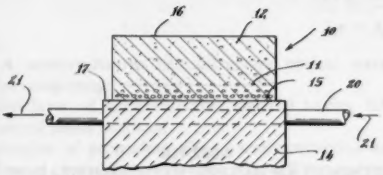
SELECTIVE RADIATION ABSORPTION DEVICES FOR PRODUCING HEAT ENERGY

Robert R. Austin, Wilton, and Roy C. Bastien, Redding, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 528,309, Nov. 29, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,368

Int. Cl.² G02B *5/20*

U.S. Cl. 350—1.1 **8 Claims**



1. A device for producing heat energy by absorption of selected radiation wavelengths having a maximum wavelength in the range of from 0.35 to 1.5 micrometers comprising a single film having boundaries at opposite sides in its thickness direction but not intermediate thereof and composed essentially of a mixture of particles of metal and a transparent dielectric material, the relative concentrations of metal and dielectric varying in transition from a major amount of metal at one of said boundaries to a major amount of dielectric at the opposite boundary, said one boundary being bounded by material which is substantially reflective of said selected radiation wavelengths, the mixture being inhomogeneous through the film between said boundaries and substantially homogeneous at any given distance from one boundary in the film with the film being a thickness at least equal to one half the longest wavelength of said selected wavelengths, and heat transfer means adjacent said one boundary for carrying heat away from the film.

4,082,414

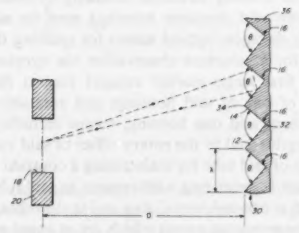
HEAT RECUPERATION

Charles A. Berg, Buckfield, Maine, assignor to Pyreflex Corporation, Sudbury, Mass.

Filed Mar. 3, 1976, Ser. No. 663,370

Int. Cl.² G02B *13/14, 5/124*

U.S. Cl. 350—1.7 **9 Claims**



1. The method of recuperating radiant heat loss from a source comprising the steps of

a. determining the solid angle into which said energy is radiated,

b. assembling an array of abutting reflecting cells, each cell comprising a plurality of reflective surfaces disposed with respect to each other at angles of about 90°, and

c. supporting said array within said solid angle at a distance from said source such that said array extends across a major fraction of said solid angle.

4,082,415

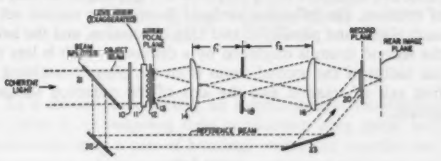
HOLOGRAPHIC LENS ARRAY AND METHOD FOR MAKING THE SAME

Robert Ellison Brooks, and Donald Charles Winter, both of Manhattan Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 455,413, Mar. 27, 1974, abandoned. This application Jun. 1, 1976, Ser. No. 691,700

Int. Cl.² G02B *27/00*

U.S. Cl. 350—3.83 **12 Claims**



1. A novel hologram providing a holographic lens array prepared by the method of projecting coherent light through a refractive fly's eye lens array to provide a number of lens images on a record member along with a reference beam to simultaneously record a number of interference patterns, comprising a record member having a light beam modulating recorded interference pattern including a plurality of like areal and spatially disposed optically transformed representations of the individual lens images having given focal lengths and predetermined spacings defining an array of holographic lenses, the area of each lens is sufficiently large to minimize diffractive effects and provide a substantial signal-to-noise ratio.

4,082,416

RADIATION SCANNING SYSTEM WITH TWO SCANNERS ROTATING ABOUT PARALLEL AXES

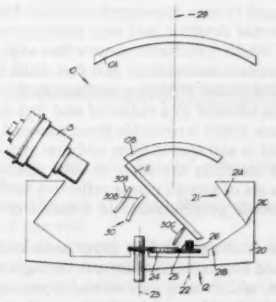
Herbert Morrison Runciman, and Peter John Berry, both of Glasgow, Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Filed Dec. 7, 1976, Ser. No. 748,327

Claims priority, application United Kingdom, Dec. 13, 1975, 51154/75

Int. Cl.² G02B *27/17*

U.S. Cl. 350—6.8 **5 Claims**



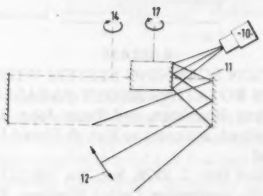
1. Apparatus for use in a radiation scanning system, comprising a radiation detector and optical means which is arranged to scan radiation from a field of view across the detector, the optical means including a radiation focussing system, a first

drum carrying a first set of reflective surfaces, the first drum being rotatable about a first axis, a second drum carrying a second set of reflective surfaces, the second drum being rotatable about a second axis parallel to said first axis, the drums being so dimensioned and located with respect to the detector that radiation transmitted by said focussing system is permitted to enter the detector after sequential reflection from reflective surfaces of said two sets of planar reflective surfaces in a manner which is independent of the position of the radiation in the field of view, wherein the first drum is annular and the first set of reflective surfaces is mounted on the inner periphery thereof, the second drum is peripherally bounded by the first drum and the second set of reflective surfaces is mounted around the second drum, the reflective surfaces forming the first set are each in the form of a pair of planar reflective members inclined at substantially right angles to each other the line of intersection of the planes containing said pair of planar reflective members being disposed at right angles to said axes of rotation, the reflective surfaces forming the second set are each planar and parallel to said axes of rotation, and the axis of the second drum is displaced by a distance which is less than the radius of the second drum from the plane containing the first axis of rotation and the axis of the radiation focussing system.

4,082,417
RADIATION SCANNING SYSTEM WITH TWO REFLECTIVE DRUMS ROTATING ABOUT PARALLEL AXES ACCORDING TO AN EQUATION

Herbert Morrison Runciman, and Peter John Berry, both of Glasgow, Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Continuation-in-part of Ser. No. 600,199, Jul. 29, 1975, Pat. No. 4,037,920. This application Feb. 9, 1977, Ser. No. 767,282
Claims priority, application United Kingdom, Oct. 26, 1974, 46424/74
Int. Cl.² G02B 27/17; H01J 3/16
U.S. Cl. 350—6.8 5 Claims



1. Apparatus for use in a radiation scanning system comprising an objective device forming convergent radiation from a field of view, a radiation detector, and an optical scan means which is arranged to scan convergent radiation from said field of view across said detector, said scan means comprising

a first drum which is rotatable about a first axis, a first set of optical members mounted on said first drum and defining a set of first planar reflective surfaces each of which extends perpendicular to a radius of said first drum,

a second drum which is rotatable about a second axis extending parallel to and spaced from said first axis, a second set of optical members mounted on said second drum and defining a set of second planar reflective surfaces each of which extends perpendicular to a radius of said second drum,

drive means rotating said first drum sequentially to move each of said first reflective surfaces through a first reflector station, and rotating said second drum sequentially to move each of said second reflective surfaces through a second reflector station,

said scan means being arranged with the respective reflective surfaces when in said first and second reflector stations oppositely facing and the first and second reflector stations axially spaced, whereby convergent radiation from said field of view enters said detector after sequential reflection at said first and second reflector stations, wherein said first drum is rotated at an angular speed s_1 and has n_1 number of reflective surfaces each of which is located at a perpendicular distance r_1 from the first axis of rotation, said second drum is rotated at an angular speed s_2 and has n_2 number of reflective surfaces each of which is located at a perpendicular distance r_2 from the second axis of rotation, the distance between the first and second axes in a plane perpendicular to said axes is d, and the detector is located at a distance a from the first rotational axis when measured in a plane perpendicular to the said axis such that the following conditions hold viz:

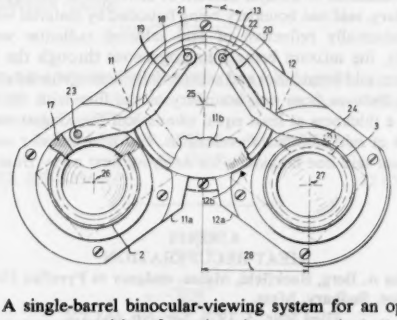
$$2a(n_1/n_2 - 1)^2 + 2d/(n_1/n_2)^2 + r_2(n_1/n_2)^2 = r_1(2n_1/n_2 - 1)^2 \quad \text{(I)}$$

$$n_1 s_1 = n_2 s_2 \quad \text{(II)}$$

4,082,418
BINOCULAR BARREL WITH ADJUSTABLE INTERPUPILLARY DISTANCE AND TARGET MARKER SUPPORT

Willi Keydell, Oberkochen, and Herbert Binder, Aalen-Hofherrnweiler, both of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed Jul. 19, 1976, Ser. No. 706,202
Claims priority, application Germany, Aug. 27, 1975, 2538048
Int. Cl.² G02B 27/32, 21/20, 7/12
U.S. Cl. 350—10 6 Claims

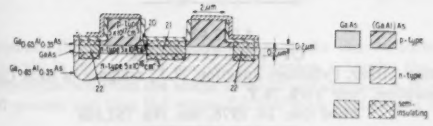


1. A single-barrel binocular-viewing system for an optical instrument, comprising frame-based structure including an elongate tube adapted to receive and pass an incident ray bundle along the tube axis, two eyepiece housings each including offset-arm housing structure rotatably connected to said tube, whereby said eyepiece housings may be adjusted for interpupilary distance, optical means for splitting the incident ray bundle for concurrent observation via eyepieces in said housings, a first target-marker support ring at the eyepiece focal plane of one of said housings and rotatable about the eyepiece axis of said one housing, means including a link of effective length equal to the rotary offset of said eyepiece axis from the axis of said tube for maintaining a constant orientation of said marker support ring with respect to said tube, said link being pinned at one end to said ring and at the other end to said framebased structure at points which are at equal-radius offset from the ring axis and from the tube axis respectively, a second target-marker support ring at the eyepiece focal plane of the other of said housings and rotatable about the eyepiece axis of said other housing, and a second similar link similarly connecting said second target-marker support ring to said frame-based structure.

4,082,419
OPTICAL WAVEGUIDE COUPLERS

George Horace Brooke Thompson, and David Francis Lovelace, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,560
Claims priority, application United Kingdom, Feb. 27, 1975, 8244/75
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.12 2 Claims



1. A semiconductive heterostructure optical waveguide coupler comprising:

a first layer of semiconductive material having first and second major surfaces;

a plurality of protruding ribs of semi-conductive material formed on said first surface, said ribs defining a plurality of optical waveguides for providing optical confinement to light;

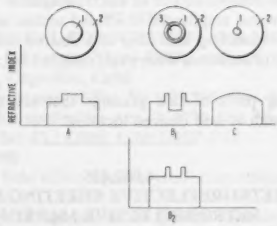
means for applying a reverse bias across said ribs and said first layer to provide a depletion region within said first layer for altering the optical coupling between the waveguides; and

a plurality of regions of semi-insulating material within the portions of said first layer intermediate said plurality of protruding ribs.

4,082,420
AN OPTICAL TRANSMISSION FIBER CONTAINING FLUORINE

Satoshi Shiraishi; Kunio Fujiwara, and Shiro Kurosaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 419,011, Nov. 26, 1973, abandoned.
This application Jan. 14, 1976, Ser. No. 648,998
Claims priority, application Japan, Nov. 25, 1972, 47-118345; Nov. 25, 1972, 47-118346
Int. Cl. G02B 5/14
U.S. Cl. 350—96.31 14 Claims

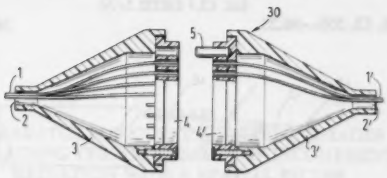


1. An optical transmission fiber wherein the refractive index varies between the periphery and the central longitudinal axis of the fiber, said variation being symmetrical with respect to the central longitudinal axis of said fiber, said fiber having at least one higher refractive index portion being made mainly of pure fused silica consisting essentially of SiO_2 and at least one lower refractive index portion being made of doped fused silica containing F, said doped fused silica consisting essentially of SiO_2 and F.

4,082,421
DEVICE FOR COUPLING TWO LIGHT CONDUCTING FIBER CABLES

Franz Auracher; Gerhard Mitterhummer, and Karl-Heinz Zeitler, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1976, Ser. No. 688,718
Claims priority, application Germany, May 22, 1975, 2522763
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.22 9 Claims

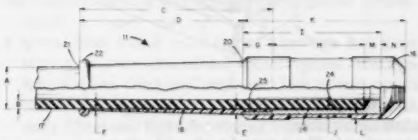


1. In a device for coupling an incoming light conducting fiber cable to an outgoing light conducting fiber cable, said device comprising a pair of housings connected together and each receiving a holder, each holder centering the fibers in one cable in relation to the fibers of the cable which are centered by the other holder with the improvements comprising each holder comprising a substrate having a first guide foil disposed on one surface and a second guide foil disposed on an opposite surface thereof, each of said first foils having a channel for each light conducting fiber of its cable, said channels in the direction leading away from the substrate possessing a cross-sectional profile decreasing to the diameter of the light conducting fiber, said second foil having a channel for each light conducting fiber aligned with the corresponding channel of the first foil, said light conducting fibers being disposed and secured in the aligned channels of the first and second foil with the end of the fibers being in the plane of the outer surface of the first foil and said device having means for optically interconnecting the ends of the light conducting fibers of one of said holders to the ends of the fibers of the other holder.

4,082,422
STRAIN-RELIEVED FIBEROPTIC CABLE

Jacobus Kloots, Sturbridge, Mass., assignor to Applied Fiberoptics, Inc., Southbridge, Mass.

Filed Jun. 21, 1976, Ser. No. 697,847
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.23 7 Claims



1. A fiberoptic cable with integral strain-relieved termination comprising:

a. an extended bundle of optical fibers, bonded and finished at at least one end;

b. one tube of elastomeric material covering said bundle and terminating short of said one end;

c. a second tube of elastomeric material having a length in the range of 4 to 16 centimeters covering and integrally bonded to said one tube, said second tube terminating proximate said one end but short of said one tube;

d. a cylindrical sleeve overlapping and adhesively bonded to said one tube and a short portion of said second tube; and,

e. a rigid housing mechanically secured to and enclosing the

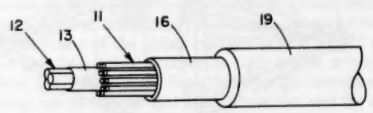
full length of said sleeve and providing an optical aperture at said one end.

4,082,423

FIBER OPTICS CABLE STRENGTHENING METHOD AND MEANS

Andrew S. Glista, Alexandria, Va., and Rodney S. Katz, Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 19, 1976, Ser. No. 715,815
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.23 **26 Claims**



1. An electrically non-conductive strengthening means for glass fiber optics bundles or other similar fiber cables capable of withstanding installation stresses as well as continuous tensile loading during service comprising:

a plurality of light energy-conducting fibers bundled together in side-by-side substantially parallel relationship with each other; and

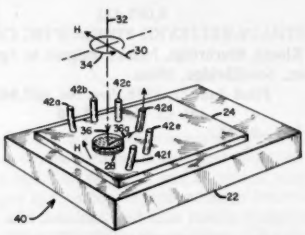
a protective binding about said bundle comprised of individual single crystal members of a compound having a high modulus of elasticity, low density and high tensile strength at environmental and substantially higher than environmental temperatures.

4,082,424

INTEGRATED OPTIC DEVICE

Gerald Francis Sauter, and George Franklin Nelson, both of St. Paul, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jul. 28, 1976, Ser. No. 709,468
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.11 **7 Claims**



1. An integrated optic device, comprising:

a substrate member;

a magnetizable film integral with said substrate member and having a plurality of parallel stripe domains aligned along a first axis in the plane thereof, said stripe domains having a substantially uniform periodicity of a width *d;*

means for directing a light beam incident to said magnetizable film;

magnetic field H means for coupling a DC external magnetic field H to said magnetizable film, said field H having a variable magnitude and polarity and a variable rotatable orientation in the plane of said magnetizable film, the variable magnitude and polarity of said field H adjustable to generate a corresponding variation in the variable width *d* of said stripe domains and a corresponding angular deflection of said light beam and said variable orientation of said field H adjustable to generate a corresponding variation in the rotatable orientation of said stripe domains and a corresponding angular rotation of said light beam;

a plurality of optic fibers oriented about a predetermined area of said magnetizable film, each oriented at a predetermined radial distance and a predetermined angular spacing and;

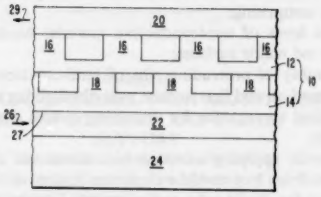
means affecting said magnetic field H means for simultaneously rotating and deflecting said light beam and directing said sorotated and deflected light beam upon a selected one of said optic fibers.

4,082,425

OPTICAL COUPLER

Arthur Miller, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,169
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.17 **8 Claims**



1. In a method of making an optical coupler that couples light between a fiber and a waveguide carried by a substrate, the steps of:

providing first and second diffraction gratings that have a common spatial frequency, and respectively diffract first and second percentages of input light whereby said first grating has a first diffraction strength and said second grating has a second diffraction strength;

contiguously connecting said gratings to provide a spatially varying overlap of the bars of said first grating by the bars of said second grating;

mounting said connected gratings upon said waveguide, thereby forming a coupling assembly;

successively placing said fiber at a multiplicity of locations upon said coupling assembly where said fiber and said waveguide form a sandwich that includes said gratings;

transmitting a light beam that causes a coupling of light between said fiber and said waveguide via said coupling assembly during the successive placing of said fiber, said first and second diffraction strengths causing first and second components of an electromagnetic field of substantially equal amplitudes to extend within said substrate;

fixedly connecting said fiber at a desired one of said multiplicity of locations where said coupled light is a maximum; and

removing parts of said gratings that are not within said sandwich at said desired location.

4,082,426

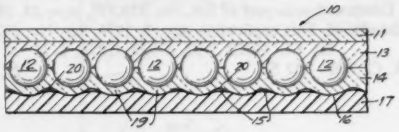
RETROREFLECTIVE SHEETING WITH RETROREFLECTIVE MARKINGS

Robert A. Brown, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 26, 1976, Ser. No. 745,401
Int. Cl.² G02B 5/128
U.S. Cl. 350—105 **3 Claims**

1. Reflective sheeting comprising a monolayer of microsphere-lenses adapted to receive light rays incident on the front surface of the sheeting, a spacing layer of polymeric material covering the back surfaces of the microsphere-lenses and contoured so as to generally follow those back surfaces, a specularly reflective layer coated over the spacing layer, and an

image layer disposed in an imagewise pattern between the spacing layer and specularly reflective layer; characterized in that the image layer is transparent and in that the thickness of the image layer is greater in the valleys of the spacing layer



between the microsphere-lenses than on the curved surfaces directly in back of the microsphere-lenses, whereby the 45° retroreflection from the image areas of said sheeting is at least 30 percent less than the retroreflection from nonimage areas.

4,082,427

HIGH REFRACTIVE INDEX GLASS COMPOSITIONS

Nobuyuki Nakashima, Fukuoka, Japan, assignor to Fukuoka Tokushu Garasu Kabushiki Kaisha, Japan

Continuation of Ser. No. 591,650, Jun. 30, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,358
Claims priority, application Japan, Jul. 2, 1974, 49-75658
Int. Cl.² C03C *3/12*; G02B *5/128*
U.S. Cl. 350—105 **3 Claims**

1. Lead-free colorless and transparent glass suitable for formation at 1300° – 1500° C of colorless, transparent glass, beads having a refractive index exceeding 2.15 for use in reflex-reflective articles, and whose composition by weight percentage is:

	% Range	Combined Range
TiO_2	55 – 65	
BaO	17 – 30	
CaO	1 – 10	
MgO	0 – 2	18 – 35%
SrO	0 – 6	
ZnO	3 – 15	
MoO_3	0 – 5	
ZrO_2	0 – 5	0.2 – 5%
Na_2O	0 – 0.5	
K_2O	0 – 0.5	0.1 – 0.5%
Li_2O	0 – 0.5	
B_2O_3	0 – 2	
SiO_2	0 – 2	
Al_2O_3	0 – 2	less than 2%
P_2O_5	0 – 2	

4,082,428

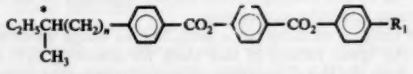
LIQUID CRYSTAL COMPOSITION AND METHOD

Ying-Yen Hsu, Mountain View, Calif., assignor to Suncrux Incorporated, Cupertino, Calif.

Continuation-in-part of Ser. No. 629,396, Nov. 6, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,698
Int. Cl.² C09K *3/34*; G02F *1/13*
U.S. Cl. 350—350 **19 Claims**

4. A nematic field-effect liquid crystal composition comprising a solution of:

(a) at least one compound of the general formula:



wherein *n* varies from 1–5, and R_1 is a radical selected from the group consisting of an n-alkyl group, an n-alkoxy group, an n-acyloxy group, an n-alkyl carbonato group, a cyano group, and a nitro group, and

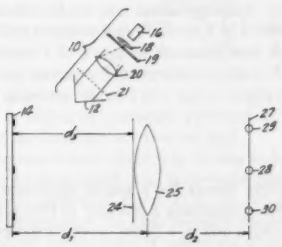
(b) a mixture of field effect esters miscible with compound (a) and having a nematic temperature range of at least 0° to 50° C and a positive dielectric anisotropy, said mixture of field-effect esters comprising a mixture of p'-substituted-p-alkyl-andp-cyanophenylbenzoates.

4,082,429

APPARATUS FOR COPYING GRAPHIC IMAGES INCLUDING THE PROCESSING OF INCOHERENT RADIATION WITH A SPATIAL FILTER

Joseph E. Ward, III, Woodbury, Minn., and John C. Huber, Hudson Twp., St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 570,349, Apr. 22, 1975, abandoned. This application Jun. 25, 1976, Ser. No. 699,785
Int. Cl.² G02B *5/32, 27/38*; G03H *1/16*
U.S. Cl. 350—162 SF **6 Claims**



1. In an apparatus for making copies of graphic images, said apparatus including an optical system for image processing comprising

(i) a souce of spatially incoherent light positioned for directing said light to an object containing said graphic image to provide an intensity distribution of light from said object; and

(ii) a lens for providing a processed image of said light distributed from said object at a predetermined image plane;

the improvement wherein said optical system further comprises

a spatial filter which is a Fourier transform hologram containing a two-dimensional point spread function and which when combined with said lens in said optical system as a lens pupil for processing incoherent light, spatially filters said light distributed from said object to attenuate predetermined spatial frequency components within an interval of spatial frequencies $0<\omega<\Omega$ and interacts with the lens to provide at the predetermined image plane processed convolution and/or correlation images of said filtered light distributed from said object, wherein within said processed convolution and/or correlation images the transmissivity or reflectivity of the hologram causes the optical transfer function to controllably attenuate spatial frequency components outside said interval of spatial frequencies and to substantially unalter the spatial components within said interval to thereby provide said graphic image at the image plane in which the higher spatial frequency components which contribute to fidelity in multi-generation copies are substantially unaltered.

4,082,430

DRIVING CIRCUIT FOR A MATRIX-ADDRESSED LIQUID CRYSTAL DISPLAY DEVICE

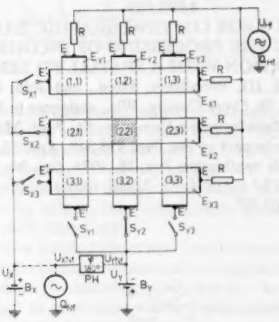
Peter U. Schulthess, Zurich, and Peter J. Wild, Wettingen, both of Switzerland, assignors to BBC Aktiengesellschaft Brown, Boveri & Company, Ltd., Baden, Switzerland

Division of Ser. No. 562,548, Mar. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 238,576, Mar. 27, 1972, abandoned. This application Jan. 21, 1977, Ser. No. 760,944

Claims priority, application Switzerland, Mar. 30, 1971, 4670/71

Int. Cl.² G02F 1/13

U.S. Cl. 350—333 **9 Claims**



1. A driving circuit for a matrix addressed liquid crystal display device comprising a plurality of row and column electrodes forming a matrix, a liquid crystal disposed between said row and column electrodes, resistor means including a plurality of resistors, circuit means connecting one end of each row and column electrode to one end of a respective one of said resistors, further circuit means connecting the other ends of each resistor to a common point, said liquid crystal having a threshold such that low frequency voltages with a magnitude above said threshold cause dynamic scattering of light in said liquid crystal, said driving circuit further comprising first source means for providing a first electric voltage of a frequency less than a given low frequency and having a magnitude greater than the threshold voltage above which said dynamic scattering is caused, said given low frequency being in a frequency range in which the threshold of said liquid crystal means is substantially frequency independent, first means for applying said first electric voltage between selected row and selected column electrodes for causing dynamic scattering at the matrix crossings defined by said selected row and selected column electrodes, and second means including second source means for simultaneously applying a second voltage having a frequency higher than said given low frequency between said selected column and selected row electrodes and said common point so that said first and second voltage components are both present simultaneously at the crossings of non-selected electrodes with selected electrodes, said second voltage of a frequency higher than said given low frequency having a magnitude and frequency at which in combination with said first voltage the dynamic scattering is substantially completely suppressed, and the dynamic scattering due to said first electric voltage alone is not suppressed at the crossing of said selected row and selected column electrodes, whereby cross-talk is avoided.

4,082,431

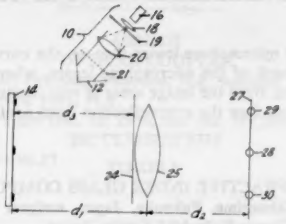
IMAGE PROCESSING SYSTEM USING INCOHERENT RADIATION AND SPATIAL FILTER HOLOGRAM

Joseph E. Ward, III, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 570,957, Apr. 22, 1975, abandoned. This application Apr. 1, 1976, Ser. No. 672,614

Int. Cl.² G02B 5/32, 27/38; G03H 1/16

U.S. Cl. 350—162 SF **22 Claims**



3. An apparatus for processing an original image containing a plurality of different complex patterns to provide a modified image in which at least one of said complex patterns is substantially unaltered, said apparatus including a system for image processing comprising

a source of spatially incoherent electromagnetic radiation positioned for directing said radiation to an object containing a said original image to provide an intensity distribution of electromagnetic radiation from said object; and

a lens for providing a processed image of said radiation distributed from said object at a predetermined image plane;

the improvement wherein the apparatus further comprises

a spatial filter which is a Fourier transform hologram containing therein a two-dimensional point spread function, and which when combined with said lens in said system as a lens pupil for processing incoherent electromagnetic radiation, spatially filters said radiation distributed from said object to attenuate predetermined discrete spatial frequency components within an interval of spatial frequencies $0 \leqq \omega \leqq \Omega$ to provide at the predetermined image plane processed convolution and/or correlation images of said filtered radiation distributed from said objects, wherein within said processed convolution and/or correlation images the transmissivity or reflectivity of the hologram causes the optical transfer function to controllably attenuate said predetermined discrete spatial frequency components of said original image and to substantially unalter at least one of said complex patterns.

4,082,432

HEAD-UP VISUAL DISPLAY SYSTEM USING ON-AXIS OPTICS WITH IMAGE WINDOW AT THE FOCAL PLANE OF THE COLLIMATING MIRROR

Robert Kay Kirschner, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 539,672, Jan. 9, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,949

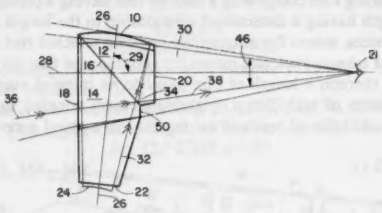
Int. Cl.² G02B 27/14

U.S. Cl. 350—174 **26 Claims**

1. An on-axis head-up optical display apparatus for use with an image generator comprising:

an image combining block including: an image window on the lower surface of said black for admitting light rays from the image generator; a generally spherical collimating mirror disposed on the upper surface of said block for collimating said generated image light rays; a front window for admitting light rays from a background view; a combining surface for combining said background view with said collimated image light rays reflected from said

collimating mirror; and a back window for viewing the combined image wherein said image window is located at



the focal plane of said collimating mirror and is generally perpendicular to the optical axis of said collimating mirror.

4,082,433

LOUVERED ECHELON LENS

Roger H. Appeldorn, Grant Township, Washington County, and Raymond H. Anderson, St. Mary's Point, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 484,619, Jul. 1, 1974, Pat. No. 3,972,593. This application Jan. 14, 1976, Ser. No. 649,217

The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.

Int. Cl.[2] G02B *3/08*

U.S. Cl. 350—211 **12 Claims**

1. In combination a layer of reflective material and a louvered echelon lens disposed over said reflective material and capable of transmitting improved contrast images reflected by said reflective material, said lens comprising a unitary sheet that includes

1. an optically clear layer having a major surface configured with at least one annular echelon lens that has a diameter of less than about one inch and is surrounded by nonlenticular structure; and
2. an internally louvered layer superposed in optical connection with the optically clear layer and comprising an optically clear polymeric matrix and a set of thin light absorbing linear louvers, each of the louvers being supported within the matrix at an angle to the faces of the louvered layer and aligned in spaced side-by-side relation so as to transmit light toward said configured surface while reducing light internally reflected within said lens.

4,082,434

WIDE-ANGLE OPTICAL SYSTEM FOR DOOR VIEWER

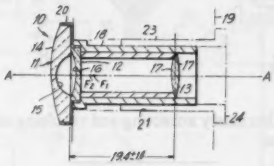
Tadaaki Hayashi, and Teruto Nakahara, both of Koganei, Japan, assignors to Kabushiki Kaisha Ka-Pu, Tokyo, Japan

Filed Sep. 17, 1976, Ser. No. 724,137

Claims priority, application Japan, Sep. 20, 1975, 50-113127; May 12, 1976, 51-53356

Int. Cl.[2] G02B *7/08*

U.S. Cl. 350—225 **10 Claims**



1. A wide-angle optical system for a door viewer, comprising

a concave objective lens of about 13 to 25 mm in diameter and about 3 to 5 mm in thickness, said concave objective lens having a front convex surface of about 20 to 30 mm in radius of curvature and having a rear concave surface of about 2 to 4 mm in depth, about 8 to 11 mm in diameter and about 4 to 6 mm in radius of curvature provided at the central portion of the rear surface thereof;

an intermediate concave lens of about 9 to 12 mm in diameter and about 1 to 3 mm in thickness, said intermediate concave lens having a front concave surface of about 6 to 10 mm in diameter, about 1 to 2 mm in depth and about 4 to 7 mm in radius of curvature provided at the central portion of the front surface thereof; and

a convex eyepiece lens of about 6 to 11 mm in diameter and about 1 to 2 mm in depth, said convex eyepiece lens having a convex surface of about 20 to 30 mm in radius of curvature provided at the both surfaces thereof; wherein

said intermediate concave lens is positioned so that the front surface thereof contacts the rear surface of said concave objective lens to oppose said front concave surface of said intermediate concave lens to said rear concave surface of said concave objective lens and so as to align the optical axis of said intermediate concave lens with that of said concave objective lens, and

said convex eyepiece lens is positioned to the rear of said concave objective lens in such a manner that the optical axis thereof is aligned with the optical axis of said concave lenses and the distance between the center of said convex eyepiece lens and the rear surface of said concave objective lens substantially corresponds to the sum of the focal length of said convex eyepiece lens and that of the lens system composed of said concave objective lens and said intermediate concave lens.

4,082,435

OPTICAL SWITCH

Vernon Zeitz, Springfield, Vt., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 7, 1976, Ser. No. 647,285

Int. Cl.[2] G05D *25/00*; G03B *9/36*

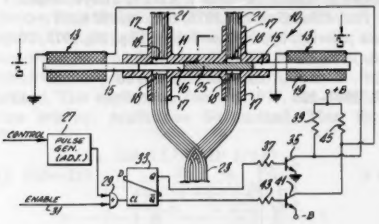
U.S. Cl. 350—269 **7 Claims**

1. A switch for interrupting one of a plurality of optical paths, comprising:

a housing, said housing having a plurality of said optical paths therethrough;

means for interrupting one of said optical paths while at least one of said optical paths is uninterrupted, said interrupting and uninterruption being a logical OR operation, said

means having permanent magnetic properties and being slidably positioned within said housing; and



means for alternately attracting and repulsing said interrupting means.

4,082,436

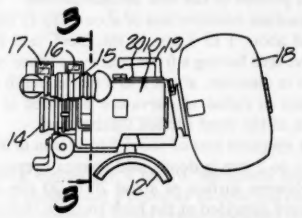
MOTION PICTURE CAMERA

Robert E. Gottschalk, 10660 Chalon Rd., Los Angeles, Calif. 90024

Division of Ser. No. 582,698, Jun. 2, 1975, which is a continuation of Ser. No. 388,630, Aug. 15, 1973, abandoned. This application Jul. 30, 1976, Ser. No. 710,164

Int. Cl.² G03B 23/02

U.S. Cl. 352—72 3 Claims



1. In a motion picture camera, the combination of: a housing, a camera movement assembly enclosed with said housing, a support member within said housing, means for mounting the camera movement assembly on said support member, sound-absorbing connector means securing said support member to said housing, said camera movement assembly being spaced from the enclosing housing and without any contact therewith, the camera housing having an upper portion provided with a first opening and having a rearward portion provided with a second opening, means for securing a film magazine selectively over either of said openings whereby a film strip in said magazine may pass through the selected opening to the camera movement assembly, a lens mount fixed on the housing and without contact with said support member, and a closure member for closing either of said openings releasably engaging said housing and closing one of said openings.

4,082,437

GAME HAVING OPTICAL PRESENTATION AND APPARATUS THEREFOR

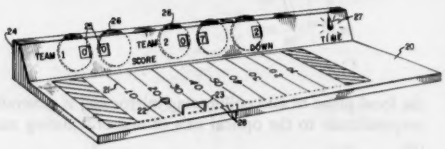
Jake Millard Williams, New York, N.Y., assignor to Nolte and Nolte, P.C., Jericho, N.Y.

Continuation of Ser. No. 293,220, Sep. 28, 1972, abandoned. This application Mar. 28, 1975, Ser. No. 563,236

Int. Cl.² G03B 21/04

U.S. Cl. 352—123 20 Claims

1. A game simulating a sports activity, comprising a plurality of reels of film each having a plurality of equal length sequences of play of said activity regularly arranged thereon, and a selective projecting apparatus adapted to singly receive said reels for projection, said apparatus comprising means for selectively advancing film from a selected reel received thereby to project a determined sequence and for inhibiting projection of more than said determined sequence said means for selectively advancing film comprising a take-up reel having a perimeter of a length having a determined relationship to the length of said sequences, means for affixing the end of a selected reel of film to said take-up reel, and means for rotating said take-up reel to wind thereon a length of film equal to an integral number of sequences of said film, a rotatable element coupled to rotate with said take-up reel and having therein a spiral groove, pin



means engaging said groove, selector means coupled to said pin means to permit changing of the position of said pin means in said groove, means inhibiting movement of said pin means in one direction at a point at which the remainder of said groove in said direction corresponds to the length of sequence on said film, and release means for releasing said stop means to permit rotation of said take-up reel whereby said take-up reel can rotate to wind thereon a length of film corresponding only to one sequence of film.

4,082,438

ZERO-ORDER DIFFRACTIVE SUBTRACTIVE FILTER PROJECTOR

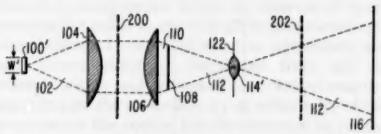
Karl Knop, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,147

Claims priority, application United Kingdom, May 30, 1975, 23629/75

Int. Cl.² G03B 21/14

U.S. Cl. 353—97 7 Claims



1. In a zero-order diffractive subtractive filter projector comprising an imaging lens having a given aperture, and illuminating means for illuminating a diffractive subtractive filter with incident light to derive zero-order output light for imaging on a screen by said imaging lens; the improvement comprising:

a mask situated in a given plane located between said imaging lens and said screen, said mask comprising a plurality of spaced transparent regions arranged in a predetermined array with adjacent transparent regions being separated by opaque regions, and

said illuminating means including means for deriving a plurality of spaced light beams arranged in a given array corresponding with said predetermined array, said given array of light beams being situated so that, in the absence of a diffractive subtractive filter in said projector, said imaging lens substantially images said respective light beams of said given array on said respective transparent regions of said mask,

whereby in the presence of a diffractive subtractive filter in said projector said zero-order output light passes through said transparent regions of said mask, but higher diffrac-

tion order output light is substantially blocked by said opaque regions of said mask.

4,082,439

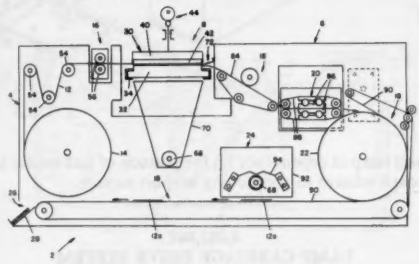
FILM DUPLICATOR

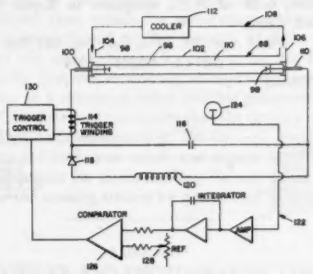
Paul N. Seitz, Zurich, Switzerland, assignor to Quantor Corporation, Mountain View, Calif.

Division of Ser. No. 501,590, Aug. 29, 1974, Pat. No. 3,958,142. This application Feb. 20, 1976, Ser. No. 659,830

Int. Cl.² G03B *27/30*

U.S. Cl. 355—100 **11 Claims**





1. A microfiche duplicator comprising a transfer station including means for positioning a master-fiche at the station, means for storing a supply of copy film, means for advancing copy film into registration with the master-fiche, and exposing means for transferring an image from the master-fiche to a section of copy film registered with the master-fiche at the transfer station, the exposing means including a light source disposed on a side of the master-fiche opposite from the film section and comprising a gas discharge lamp having an inner tube enveloping spaced apart electrodes disposed in a gas atmosphere, an electrical power source for the lamp, a light transmissive tubular member surrounding the tube, and electrically conductive liquid means disposed in a space between the tube and the member acting as an external trigger device for the lamp for triggering the lamp with a relatively low trigger voltage.

4,082,440

COMPACT MICROFORM READER

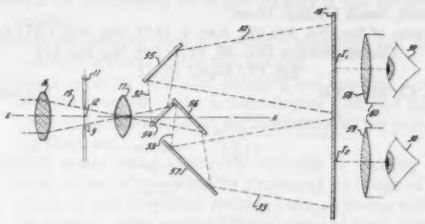
Frank P. Bennett, Franklin Lakes, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,984

Int. Cl.² G03B *23/12, 21/22*

U.S. Cl. 353—26 R **6 Claims**

1. A portable microform reader comprising a light tight housing, a microform holder carried by said housing for supporting therein a microform for viewing, a projection screen mounted within said housing, a projection system carried within said housing for projecting a pair of identical mono-images of a portion of said microform in side-by-side relation onto the rear side of said projection screen, said projection system including a source of illumination and means connected thereto for energizing said source of illumination, a condenser lens positioned between said source of illumination and said microform holder so as to direct a beam of illumination through a portion of a microform in said holder for viewing, a projection lens positioned for projecting an image of said portion of said microform toward said screen, and beam splitting means positioned between said projection lens and said screen for dividing the image projected by said lens into identical first and second images thereof and for reflecting said first and second images onto said screen in side-by-side relation, said projection screen supported within said housing and being translucent so that said identical pair of images may be viewed on the front side thereof, and a magnifying system having first and second magnifying lenses interocularly spaced for binocular viewing of said pair of images on the front side of said viewing screen, said screen being positioned between said magnifying system and said microform carrier, and said magnifying lenses being in optical alignment with said images on said screen for viewing an enlarged virtual mono-image thereof.



4,082,441

METHOD AND APPARATUS FOR PRODUCING AND FIXING A VISIBLE IMAGE ON A THERMOPLASTIC LAYER OF A PHOTOCONDUCTIVE MATERIAL

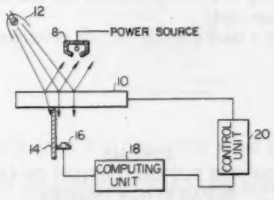
Yukio Yamada; Michiharu Abe, and Akiyoshi Oride, all of Tokyo, Japan, assignors to Ricoh Co. Ltd., Tokyo, Japan

Filed Dec. 1, 1975, Ser. No. 636,392

Claims priority, application Japan, Dec. 3, 1974, 49-139926

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **11 Claims**



1. In a method of producing and fixing a visible image on a photoconductive material, the photoconductive material comprising a photoconductive layer on which a transparent thermoplastic layer is formed, the steps of:

(a) radiating a light image onto the thermoplastic layer;

(b) heating the thermoplastic layer to a softening point thereof;

(c) sensing an intensity of the light image at a point to which the light image is diffracted by the visible image being formed on the photoconductive material;

(d) automatically electronically computing the rate of change of the sensed intensity of the light image in a manner as to differentiate the sensed intensity; and

(e) automatically terminating the application of heat to the thermoplastic layer when the rate of change of intensity of the light image reaches a value substantially equal to zero.

4,082,442

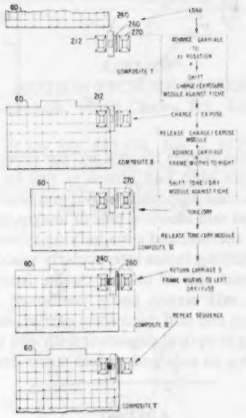
ELECTROPHOTOGRAPHIC METHOD FOR PRODUCTION OF PLURAL IMAGES ON A SHEET

Frank C. Gross, Wilbraham, Mass., assignor to A. B. Dick/-Scott, South Hadley, Mass.

Division of Ser. No. 349,452, Apr. 9, 1973, Pat. No. 3,972,610. This application Dec. 30, 1975, Ser. No. 645,429

Int. Cl.[2] G03G *13/22*

U.S. Cl. 355—3 R **30 Claims**



1. The method of microelectrophotography which includes sequentially transporting a photosensitive substrate through a series of discrete steps which comprise:

[i] forming at a first stationary position a latent electrostatic microimage on the photosenstive substrate, said substrate having been provided at said first position with a substantially uniform electrostatic charge only over the area thereof corresponding to that microimaged;

[ii] developing at a second position the said latent electrostatic image; and

[iii] fixing at a third position the said developed image.

4,082,443

SYSTEM FOR SUPERPOSITION OF COLOR SEPARATION IMAGES

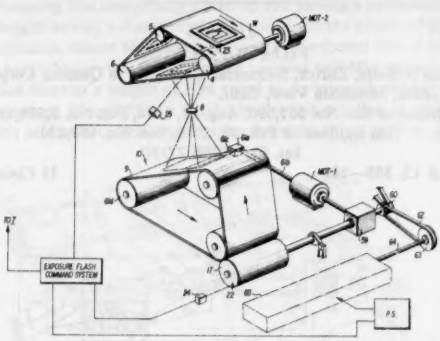
Vaidevutis C. Draugelis, Rochester, and Eugene D. Schafer, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 8, 1976, Ser. No. 647,470

Int. Cl.[2] G03G *15/01*

U.S. Cl. 355—4 **6 Claims**

1. A reproduction machine for processing color separation masters comprising an exposure station including a flash lamp, an imaging surface movable past said station, means for moving a plurality of said color separation masters past said exposure station successively, means for energizing said lamp to create a plurality of spaced apart electrostatic latent images on said imaging surface, means for developing said successive images with different color developer, rotatable means for successively bringing a support surface into contact with said developed images, and means for controlling the energization



of said lamp in dependence on the position of said master to be exposed relative to the moving support surface.

4,082,444

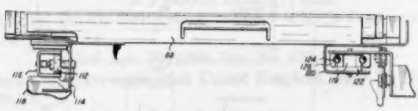
LAMP CARRIAGE DRIVE SYSTEM

Sukumaran K. Menon, Webster, and Stephen J. Wenthe, Jr., Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1976, Ser. No. 681,956

Int. Cl.[2] G03G *15/28*

U.S. Cl. 355—8 **6 Claims**



1. An apparatus for illuminating an article, including:

a light source;

means for supporting the article in a light receiving relationship with light rays transmitted from said light source;

a carriage having said light source mounted thereon;

a drive system for moving said carriage;

a frame;

a first U-shaped member mounted on said frame;

a pair of spaced rollers mounted rotatable on one end of said carriage and disposed in said first U-shaped member;

an inner slide member secured to the other side of said carriage;

an outer slide member secured to said frame; and

a plurality of ball bearings interposed between said inner slide member and said outer slide member providing a rolling support for said carriage.

4,082,445

TONER CONTROL SYSTEM FOR AN ELECTROSTATIC REPRODUCTION MACHINE

Edward L. Steiner, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 634,018, Nov. 21, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,334

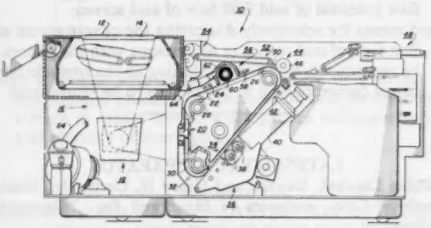
Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 **5 Claims**

1. In an electrostatic reproduction machine having a developing apparatus for applying toner to an electrostatic latent image of an original on a photoreceptor to develop the latent image, means for replenishing toner in the developing apparatus to compensate for toner depletion resulting from the development of a plurality of latent images, and means for produc-

ing a developed test image on the photoreceptor, an improved control system for controlling the operation of the replenishing means by comparing the difference between the amount of light reflected from an undeveloped area of the photoreceptor and the amount reflected from the developed test image to a reference value, the control system comprising:

a sensing station having a light source and a light sensitive device, means including the light source for sequentially directing light toward the undeveloped area of the photoreceptor and the test image, means including the light sensitive device for sequentially measuring the amount of light reflected from the undeveloped area and from the



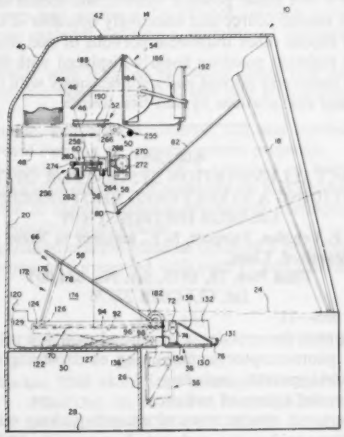
test image, means for generating a first signal which is proportional to the amount of light reflected from the undeveloped area, means for generating a second signal which is proportional to the amount of light reflected from the test image, means for measuring the difference between the first and second signals and for comparing the difference to a reference value and for generating a third signal if the difference indicates that the density of the test image does not correspond to the desired density represented by the reference value, and means including error detecting means for compensating for any toner accumulation on the sensing station by generating an error signal.

4,082,446

SLIDE VIEWER AND PHOTOGRAPHIC COPIER

John J. Driscoll, Andover; Thomas A. Svatek, Carlisle, and Richard R. Wareham, Marblehead, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 2, 1977, Ser. No. 764,719
Int. Cl.[2] G03B 27/32, 27/52
U.S. Cl. 355—27 **4 Claims**



1. Photographic apparatus being selectively operable for projecting an image of an object onto a viewing surface for viewing and for making a photographic copy of the object utilizing a self-developing film unit of the type including an integral supply of fluid processing composition that is adapted to be distributed between predetermined. layers thereof subsequent to exposure, said apparatus comprising:

a housing;

means for releasably holding a plurality of such objects;

means being operable for moving the objects, in sequence, from said holding means to a projection position within said housing for image projection and thereafter back to said holding means;

means for illuminating the object located at said projection position;

means for locating such a self-developing film unit at an exposure position within said housing;

pressure applying means for engaging and applying a compressive pressure to the self-developing film unit subsequent to exposure to effect the distribution of the processing fluid; and

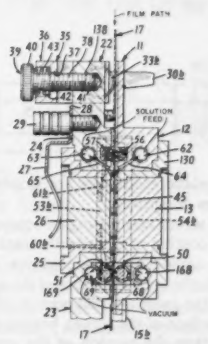
optical means being selectively operable in viewing and copy modes of operation for projecting an image of the object at said projection position onto a viewing surface for viewing when operated in said viewing mode and for projecting an image of the object at said projection position onto the self-developing film unit located at said exposure position to effect the exposure of the film unit when operated in said copy mode.

4,082,447

WET GATE EMBODIED IN A PHOTOGRAPHIC STRIP FILM PRINTER

Louis Ferdinand Pascuzzi, Mount Vernon, N.Y., assignor to Cineffects Color Laboratory Inc., New York, N.Y.

Filed Feb. 3, 1977, Ser. No. 765,085
Int. Cl.[2] G03B 27/52, 27/68
U.S. Cl. 355—30 **5 Claims**



1. In a photographic strip film printer a wet gate assembly comprising:

(1) a pair of complementary gate halves demountably fastened together to form between opposed faces thereof a through strip film path from top entrance ends down to bottom exit ends thereof;

(2) a pair of light-transmitting optical windows having substantially aligned transverse central axes respectively fitted into one of a pair of opposed apertures separately formed in said gate halves with said windows located in transversely spaced-apart relation on opposite sides of said path to define a chamber therebetween;

(3) cooperative leakage blocking means provided on the opposed faces of said gate halves along opposite sides of said windows closing the sides of said chamber;

(4) transverse leakage blocking means cooperatively provided on the entrance ends of said gate halves for preventing leakage up out of the gate assembly chamber while

permitting strip film to be drafted down therethrough between said transversely spaced windows;

(5) a pair of transverse manifolds each provided in one of said gate halves above the window in such gate half with each manifold having means adapted to be connectable to a source of pressurized liquid and provided with transversely spaced passage outlets communicating with the upper portion of the chamber;

(6) a pair of cooperating transverse squeegee rollers each rotatably mounted at the face of and by one of said gate halves below the window therein with at least an arcuate longitudinal zone of each roller extending laterally forward beyond the face of the gate half supporting it with the opposed arcuate longitudinal zones of said rollers biased toward longitudinal contact with each other, said rollers extending laterally to cooperating positions relative to said side leakage blocking means and in cooperative sealing relation with respect to each other for closure of the bottom of the chamber; and

(7) means defining behind each of said rollers in the gate half supporting the latter a transverse channel connectable to suction means for drawing off liquid from the chamber at said rollers while substantially blocking leakage below the latter.

4,082,448

ELECTROSTATIC MODULATOR FOR CONTROL OF FLOW OF CHARGED PARTICLES

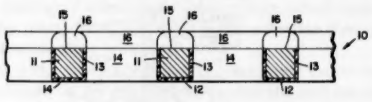
Gerald L. Pressman, Cupertino, Calif., assignor to ElectroPrint, Cupertino, Calif.

Continuation-in-part of Ser. No. 291,487, Sep. 22, 1972, Pat. No. 3,850,628, which is a division of Ser. No. 85,070, Oct. 29, 1970, Pat. No. 3,694,200. This application Nov. 25, 1974, Ser. No. 527,101

The portion of the term of this patent subsequent to Sep. 26, 1989, has been disclaimed.

Int. Cl.[2] G03G *15/052*

U.S. Cl. 355—3 SC **24 Claims**



1. An electrostatic modulator for controlling the flow of charged particles comprising:

An apertured screen comprising an equipotential conductive core and a coating of electrically insulative material covering said equipotential conductive core and forming substantially the entire surfaces of the screen and the inner surfaces of the aperture, that portion of the coating covering the first face of the screen having different geometric properties than the portion of the coating covering the second face of the screen so that when said first and second faces of said screens are simultaneously charged for a preselected period of time, the first face of the screen retains a different potential following completion of charging than the second face of the screen; means for simultaneously charging the coating over both faces of the screen with like charges for said preselected period of time; and means for selectively dissipating the charge across one face of the screen in accordance with a pattern to be reproduced, thereby establishing an electrostatic latent image corresponding to the pattern to be reproduced.

22. An electrostatic modulator for controlling the flow of charged particles comprising:

an apertured screen having first and second opposed faces, said screen including a coating of electrically insulative material forming substantially the entire surfaces of the screen including the inner surfaces of the apertures, that portion of the coating covering the second face of the screen having different electrical properties from the portion of the coating covering the first face of the screen, said portion of said coating covering the second face of said screen having a non-linear resistance characteristic at all voltage levels above a first pre-determined value, where said first predetermined value is less than a second predetermined voltage value which the portion of the coating covering the first face is designed to acquire during charging by charging means;

charging means located adjacent the first face of said screen for charging said faces to said predetermined voltages with charges of like polarity, said second face of the screen acquiring a surface potential smaller than the surface potential of said first face of said screen;

and means for selectively dissipating the charge across said first face of said screen in accordance with the pattern to be reproduced, thereby establishing an electrostatic latent image corresponding to the pattern to be reproduced.

4,082,449

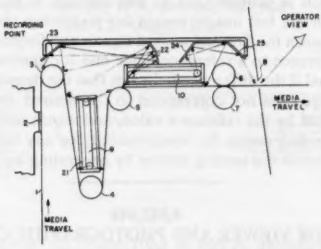
LATENSIFYING APPARATUS

Markian Lapchak, Denver, and Henry H. Curtis, Jr., Sedalia, both of Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 28, 1976, Ser. No. 652,970

Int. Cl.[2] G03B *27/76, 27/54*

U.S. Cl. 355—69 **6 Claims**



1. Apparatus for latensifying images which have been recorded on direct print media comprising first and second sources of latensifying radiation, said first source being operable to expose a first transverse portion of said direct print media at a first linear position thereof, and means associated with said second source and selectively operable in an on/off mode to expose other transverse portions of said direct print media at different positions linearly displaced with respect to said first transverse portion and simultaneously with the exposure of said first portions by said first source.

4,082,450

COMPACT ILLUMINATION SYSTEM FOR OPTICALLY PROVIDING A STRUCTURED PHOTORECEPTOR CHARGE DISTRIBUTION

Richard F. Lehman, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1975, Ser. No. 634,007

Int. Cl.[2] G03B *27/76*

U.S. Cl. 355—71 **6 Claims**

1. A system for applying a structured radiation pattern to a charged photoreceptor surface in an electrostatographic reproduction apparatus, including:

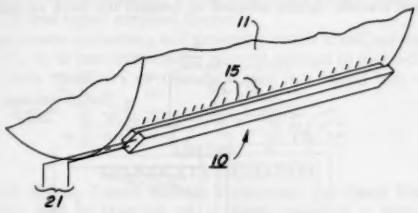
an extended source of radiation,

an apertured opaque material extending along said source between said source and said photoreceptor surface, said opaque material defining a plurality of apertures therealong,

a lenticular strip member extending along said source be-

tween said opaque material and said photoreceptor surface,

said source, said opaque material, and said lenticular strip together forming an integral pattern projector,



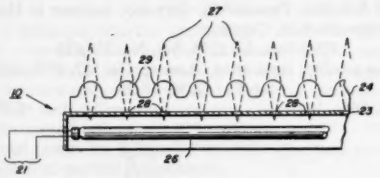
said lenticular strip including a plurality of lenselets for imaging said plurality of apertures on said photoreceptor surface to create therein a dot pattern corresponding to said plurality of apertures.

4,082,451

COMPACT ILLUMINATION SYSTEM FOR OPTICALLY PROVIDING A STRUCTURED PHOTORECEPTOR CHARGE DISTRIBUTION

Vinod Patel, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1975, Ser. No. 634,017
Int. Cl.² G03B *27/76*
U.S. Cl. 355—71 **7 Claims**



1. A system for applying a structured radiation pattern to a charged photoreceptor surface in an electrostatographic reproduction apparatus, including:

an extended source of radiation,

an apertured opaque material extending along said source between said source and said photoreceptor surface, said opaque material defining a plurality of apertures therealong,

a lenticular strip member extending along said source between said opaque material and said photoreceptor surface,

said source, said opaque material, and said lenticular strip together forming an integral pattern projector,

said lenticular strip including a plurality of lenselets for imaging said plurality of apertures on said photoreceptor surface to create therein a dot pattern corresponding to said plurality of apertures,

said apertured opaque material defining a plurality of said apertures to correspond with each of said lenselets.

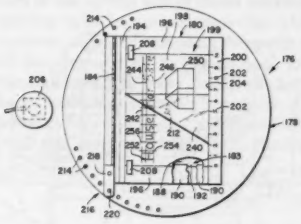
4,082,452

PHOTOPRINTING ATTACHMENT SYSTEM FOR ENLARGERS

Eugene Becker, 7348 183rd St., Flushing, N.Y. 11366

Filed Oct. 10, 1975, Ser. No. 621,473
Int. Cl.² G03B *27/58, 27/32*
U.S. Cl. 355—74 **20 Claims**

1. In a photoprinting attachment system for printing visual material from transparency means onto light sensitive means through photographic enlarging devices having means to project a light path through a transparency station toward a light sensitive means holding station: the improvement comprising easel means for positioning within a path of projected light projected by such a photographic enlarging device; comprising main frame means comprising a light sensitive holding station means, movable shield means, a layout sheet holding



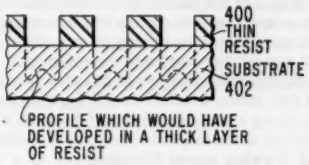
station, and registration means for selectively positioning layout sheet means on the layout sheet station in registration with light sensitive means positioned on the light sensitive means holding station, said movable shield means being movable from a first position covering said light sensitive means holding station to a second position leaving said light sensitive means holding station uncovered.

4,082,453

FABRICATION OF RECTANGULAR RELIEF PROFILES IN PHOTORESIST

Karl Knop, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jun. 9, 1976, Ser. No. 694,374
Claims priority, application United Kingdom, May 26, 1976, 03085/76
Int. Cl.² G02B *27/38;* G03C *5/04;* G03B *27/04, 27/02*
U.S. Cl. 355—88 **6 Claims**



1. In a master recording for use to form a stamper for embossing two of three subtractive primary colors in a single surface of a transparent plastic sheet in the fabrication of diffractive, subtractive filters, said master recording comprising a substrate supporting a developed photoresist layer which layer has a given maximum thickness; said layer defining a predetermined rectangular relief-profile diffractive structure, the improvement;

wherein said diffractive structure comprises a first diffraction grating having a first given depth corresponding to a first of said two primary colors of zero-order diffraction light and a second diffraction grating having a second given depth different from said first given depth corresponding to a second of said two primary colors of zero-order diffraction light, said second diffraction grating being at least partly superimposed on said first diffraction grating, and

wherein said given maximum thickness of said developed photoresist layer is equal to the sum of said first and second given depths and the thickness of said developed photoresist at any point on the master recording is equal to the sum of the depths of the superimposed diffraction gratings at that point.

4,082,454
MODULAR MICROFICHE DUPLICATOR

Dean H. Putnam, Toledo, Ohio, assignor to Magnagard Equipment & Manufacturing Corporation, Toledo, Ohio

Filed Jun. 16, 1975, Ser. No. 587,082
Int. Cl.[2] G03B 27/04
U.S. Cl. 355—99 4 Claims

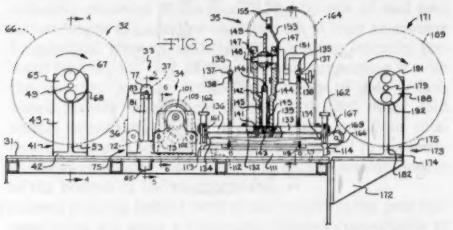


FIG 2

1. A modular microfiche duplicator comprising a basic processing module for exposing an unexposed segment of microfilm to duplicate a master microfiche and a film advancing module, separable from said basic processing module, for drawing said segment from said basic processing module and for receiving said segment, said basic processing module including:

a film supply station, having a motor driven, rotatably mounted reel of unexposed microfilm, for supplying a continuous strip of unexposed microfilm upon which said segment is defined;

a film exposure station for exposing said master microfiche and said segment in superposition to a source of radiant energy to define on said segment an image from said master microfiche;

a film feed station intermediate said film supply station and said film exposure station having means for drawing a predetermined maximum length of said continuous strip of microfilm into said film feed station, means for indicating the length of the portion of said continuous strip of microfilm in said film feed station, and means responsive to said indicating means for turning on and off the motor driving said reel of said unexposed microfilm; and

wherein said indicating means includes microswitch actuating cam means attached to said drawing means and movable along a predetermined path between first and second positions at the respective end points of said path wherein said drawing means is responsive to a predetermined minimum length of said portion of said continuous strip of microfilm to move said microswitch actuating cam means to said first position and wherein said indication responsive means includes a first microswitch, connected between the motor driving said reel of unexposed microfilm and a motor power source, located adjacent said first position for actuation by said microswitch actuating cam means to turn on the motor to supply said continuous strip of film to said film feed station.

4,082,455
PLATE MAKING SYSTEM

Ward E. Brigham, Rutherford, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Jun. 2, 1977, Ser. No. 802,980
Int. Cl.[2] G03B 27/30, 27/60, 27/02
U.S. Cl. 355—100 22 Claims

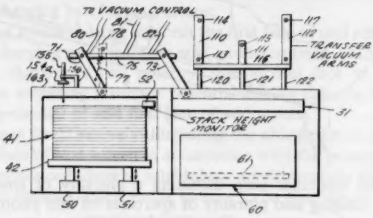
1. A plate making system comprising, in combination: means for supporting a stack of aluminum photographic plates with their emulsion side facing downward;

a film negative carrier for supporting a film negative in accurate registry with said stack; said film negative carrier having an upper surface at about the same height as the top of said stack;

plate exposure lamp means disposed beneath said film negative carrier for exposing plates disposed atop said film negative carrier through a negative fastened thereon;

output means for delivering an exposed plate from said system, with its emulsion side facing upward, to a photoprocessing unit for developing said plate;

first transfer means adapted to contact the back surface of



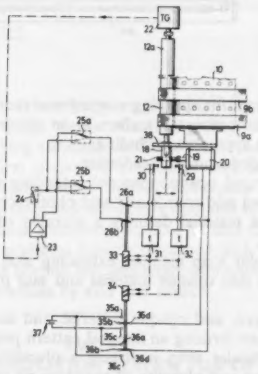
the uppermost plate of said stack of plates and to move said uppermost plate, with its emulsion surface facing down, onto said film negative carrier;

second transfer means adapted to contact the back surface of a plate on said film negative carrier and to move said plate, and invert it to have its emulsion side facing upwardly, and to deposit said plate onto said output means.

4,082,456
DEVICE FOR ADJUSTING AN ORIGINAL TO BE COPIED

Herbert Schröter, Taunusstein, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Dec. 23, 1976, Ser. No. 753,628
Claims priority, application Germany, Dec. 27, 1975, 2558874
Int. Cl.[2] G03B 27/12
U.S. Cl. 355—109 6 Claims



1. In a device for adjusting an original to be copied, in particular an original which is repeatedly conveyed through the exposure station of a photocopying machine, including a transport mechanism with a deviatable transport band arrangement adapted to transport said original at a variable speed,

and when said original is to be copied a number of times, in a closed path, further including a device for lengthening the path on one side,

two switches positioned transversely and normal to the direction of flow and adapted to be actuated by the original whereby a switching circuit to a servomotor is closed when the leading edge of the original deviates from a correct position,

said servomotor being connected to a correcting element

adapted to change the length of the path of the original on one side of said transport band arrangement,

the improvement comprising generator means adapted to put out a first signal proportional to the transport speed of said original,

said servomotor having a rotational speed proportional to a second signal supplied thereto,

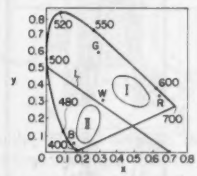
and means connecting said generator means to said servomotor by at least one transfer element adapted to proportionately transform or transduce said first signal into said second signal.

4,082,457

LEUKOCYTE DETECTOR

Hideki Kohno, Tokyo; Akihide Hashizume, and Shinji Yamamoto, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 8, 1976, Ser. No. 664,567
Claims priority, application Japan, Mar. 7, 1975, 50-27113
Int. Cl.[2] G01N *33/16*
U.S. Cl. 356—39 **1 Claim**



1. A leukocyte detector comprising:

first means for resolving the entire microscopic image of a stained blood smear, each portion of said image being simultaneously observed, into respective spectral components with different wavelengths contained within at least the wavelength ranges 420 – 440 μm and 520 – 570 μm;

second means for measuring the light quantities of said respective spectral components;

third means for making a prescribed operational calculation by using as a variable each light quantity obtained from said second means; and

fourth means for comparing the result of the calculation by said third means with a predetermined threshold limit value;

whereby the presence of leukocytes is indicated by the output from said fourth means; and wherein

said third means comprises fifth means for calculating the abscissa and ordinate on a chromaticity diagram from the determined light quantities of the respective wave lengths, and sixth means for calculating the sum of the outputs from said fifth means, and wherein the output from said sixth means is compared with said threshold limit value.

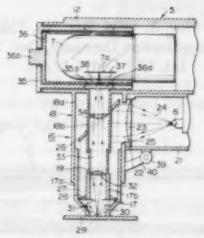
4,082,458

DENSITOMETER

Takashi Fukui, and Hirobumi Enomoto, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 8, 1976, Ser. No. 721,219
Claims priority, application Japan, Sep. 8, 1975, 50-108642
Int. Cl.[2] G01N *21/22, 21/48;* G02B *7/00*
U.S. Cl. 356—73 **10 Claims**

1. A densitometer which has a double structured lens barrel comprised of an inner cylinder and an outer cylinder extending coaxially therewith in which an annular light passage is formed between the inner and outer cylinders, a flux of light between the cylinders is condensed on the front face of a sample through a condenser optical system provided between said cylinders when reflection optical density of the sample is measured, the back face of the sample is illuminated with a flux of light from a light source located under the sample when transmission optical density of the sample is measured, and the light reflected by or transmitted through the sample is guided to a photodetector through said inner cylinder, the improvement comprising a fixed portion and a movable portion which constitute said double structured lens barrel, said movable portion being slidably engaged with the fixed portion and movable in the direction of the optical axis of lenses installed therein, said movable portion including an inner movable cylinder, an outer movable cylinder coaxially extending therewith and extending downward therebeyond and having an open lower end, said fixed portion including an inner fixed cylinder and an outer fixed cylinder extending coaxially therewith, said inner and outer movable cylinders of said movable portion being slidably engaged with said inner and outer fixed cylinders of the fixed



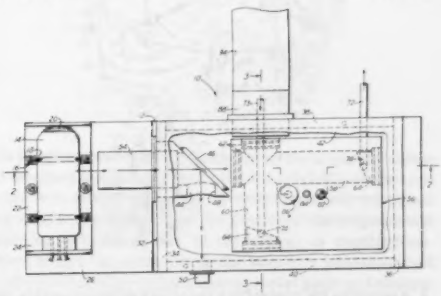
portion, a condenser optical system provided between said inner and outer movable cylinders for normally condensing a flux of parallel light therebetween to a point at the center of said open lower end of the outer movable cylinder regardless of the position of the movable portion, a collimator lens provided in said inner movable cylinder which has a focusing point at said point at the center of the open lower end of the outer movable cylinder, and a light source chamber which includes a light source for reflection density measurement connected with the fixed portion, said light source chamber including a light source and a collimator lens having an optical axis being perpendicular to the optical axis of said collimator lens in said inner movable cylinder and means for moving said open lower end of the outer movable cylinder into contact with the surface of a sample during the measurement of the optical density of the sample.

4,082,459

ANALYTICAL CELL ASSEMBLY FOR AN ANALYZER

Court Lone Wolfe, Pittsburgh, Pa., assignor to Chemed Corporation, Cincinnati, Ohio

Filed May 27, 1976, Ser. No. 690,627
Int. Cl.[2] G01N *21/52*
U.S. Cl. 356—85 **16 Claims**



1. In combination, a base member, source means mounted on said base member, a modular sample cell, means to removably mount said cell on said base member, an enclosure mounted on said base member enclosing at least said cell when it is mounted

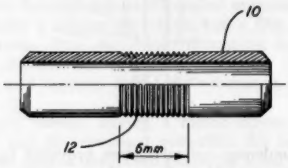
on said mounting means, means to flow sample to, through and thence out of said cell via said cell mounting means, means to direct the energy from said source means to said cell, said cell comprising a body member formed with intersecting fluid flow passageways extending through said body member, window means at an end of each passageway and light trap means at the opposite end of each passageway, heating means for said cell, and means to mount said heating means in contact with said cell.

4,082,460

GRAPHITE TUBE FOR USE IN A FLAMELESS ATOMIC ABSORPTION SPECTROMETER

Klaus Joachim Braun, Uberlingen, and Hans Gunter Gerhard Siess, Owingen, both of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen (Bodensee), Germany

Filed Nov. 3, 1976, Ser. No. 738,478
Claims priority, application Germany, Dec. 29, 1975, 2558948
Int. Cl.² G01N *21/54*
U.S. Cl. 356—85 **6 Claims**



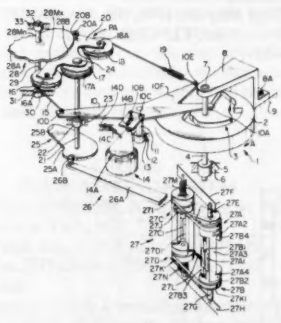
1. In an atomic absorption spectrometer for measuring the flameless absorption of samples having a graphite tube for receiving said samples, the improvement comprising a mechanically roughened area on at least a portion of the outer peripheral surface of said graphite tube for providing substantially constant emissivity for pyrometric temperature measurement.

4,082,461

OPTICAL SLIT CONTROL APPARATUS

Henry Manifold Mould, Buckinghamshire, England, assignor to Perkin-Elmer Limited, Beaconsfield, England

Filed Nov. 23, 1976, Ser. No. 744,361
Claims priority, application United Kingdom, Nov. 28, 1975, 48909/75
Int. Cl.² G01J *3/04*
U.S. Cl. 356—100 **18 Claims**



1. Apparatus for controlling the width of an adjustable slit in response to the product of two variable functions, one of which is programmed, comprising:

at least one adjustable optical slit means; slit width programming means for producing a first displacement that is a logarithmic function of the instantaneous slit width conforming to a predetermined program;

antilogarithm generating means for producing a second displacement that is the antilogarithm of said first displacement;

phase adjusting means for controlling the phasing between said first displacement and said second displacement;

slit width selection means operative on said phase adjusting means for controlling said phasing in accordance with a given slit width selection; and

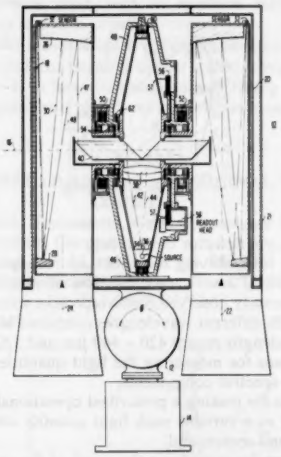
actuating means responsive to said second displacement and operative on said slit means for controlling its width.

4,082,462

AUTOMATIC SPACE SEXTANT

William J. Owen, Littleton, Colo., assignor to Martin Marietta Corporation, Rockville, Md.

Filed Feb. 23, 1976, Ser. No. 660,590
Int. Cl.² G01B *11/26*
U.S. Cl. 356—152 **7 Claims**



1. In an apparatus for determining position by obtaining a plurality of celestial fixes including first and second optical means gimbaled for movement about a common axis of rotation, said first optical means disposed to receive radiation emitted from a first celestial body and said second optical means disposed to receive radiation emitted from a second celestial body, first and second timing sensors associated respectively with each optical means to receive radiation from said celestial bodies, the improvement comprising:

rotating means disposed on said common axis of rotation, said rotating means carrying a source of light thereon, said source generating a collimated beam of light; and

means disposed on said rotating means to direct said collimated beam of light through said first and second optical means on to said sensors, whereby said collimated beam is utilized to generate timing signals indicative of the scalar angle between said first and second optical means.

4,082,463

CALIBRATED OPTICAL MICROMETER

Jack T. Dehait, Dayton; David C. Dietz, Xenia; Milo S. Snyder, Xenia, and Francis M. Taylor, Xenia, all of Ohio, assignors to Systems Research Laboratories, Inc., Dayton, Ohio

Filed Jan. 6, 1977, Ser. No. 757,217
Int. Cl.² G01B *11/00*
U.S. Cl. 356—167 **4 Claims**

1. A method of measuring the dimensions of articles placed

within the zone of measurement of an optical micrometer including the steps of

scanning a beam of light through the zone of measurement;

determining the beginning and end of each scan cycle;

generating clock pulses which are equally spaced in time;

calibrating the optical micrometer by:

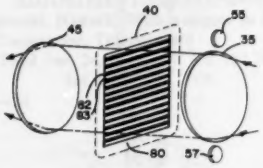
temporarily introducing a grate into the optical path within the zone of measurement, the grate having a plurality of alternate light transmitting and opaque segments spaced a predetermined distance apart;

recording the total number of clock pulses (Nt) occurring in a calibration scan cycle;

recording the number of clock pulses occurring in the interval between the beginning of the calibration scan cycle and in each segment of the grate;

thereafter measuring the dimensions of articles placed in the zone of measurement by:

temporarily recording the number of clock pulses (N1)



occurring in the interval between the beginning of the measurement scan cycle and the first edge of the article, the number of pulses (N2) occurring in the interval as the beam scans from the first to the last edge of the article, and the total number of pulses (N3) occurring in the measurement scan cycle;

determining the ratio (R) of the total pulses in the calibration scan cycle and the total pulses in the measurement scan cycle ($N_t/N3$);

multiplying the ratio (R) times the numbers N1 and N2 to obtain adjusted numbers N'1 and N'2 independent of the scan speed of the beam,

comparing the numbers N'1 and N'2 with the numbers previously recorded during the calibration scan cycle to determine the position of the edges of the article relative to the location of the segments of the previously installed grate; and

determining therefrom the dimension of the article placed in the zone of measurement.

4,082,464

OPTICAL ANALYSIS SYSTEM HAVING ROTATING FILTERS

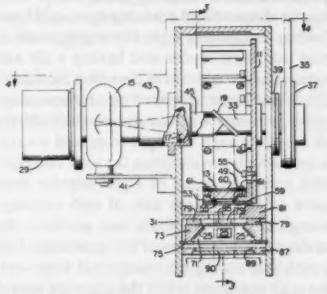
Robert Lincoln Johnson, Jr., Brattleboro, Vt., assignor to Neotec Corporation, Silver Spring, Md.

Filed Oct. 7, 1976, Ser. No. 730,677

Int. Cl.[2] G01J *3/50*

U.S. Cl. 356—188 **9 Claims**

1. An optical analysis system comprising a plurality of interference filters, means for mounting said interference filters at positions disposed generally on a cylindrical locus, each said filter having a surface disposed perpendicularly to a plane defined by said locus and facing the axis of said locus, means for rotating said filters about the axis of said locus, means for providing a beam of light passing in a radial direction through said cylindrical locus whereby said filters are rotated in sequence through said beam of light, each said filter adapted to transmit a range of wavelengths of said light as it is rotated through said beam, means for positioning a test sample in said beam of light after it has passed through said cylindrical locus, photodetecting means to detect light from said beam after said light has come into optical contact with said test sample, and to provide a signal indicative of said detected light, and means responsive to said signal only at a plurality of predetermined times as each said filter is rotated through said light beam to determine a characteristic of said sample, each said predeter-



mined time corresponding to a different wavelength within the variable wavelength range transmitted by said filter during its rotation through said light beam.

4,082,465

DETERMINATION OF EXTREME DENSITY VALUES OF PHOTOGRAPHIC ORIGINALS

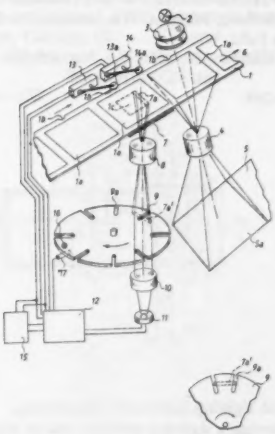
Horst Bickl, Pullach; Helmut Treiber, Munich; Gunter Findeis, Sauerlach; Bernhard Knör; Bernd Payrhammer, both of Munich, and Berthold Fergg, Taufkirchen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Continuation of Ser. No. 616,399, Sep. 24, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,136

Claims priority, application Germany, Sep. 25, 1974, 2445831

Int. Cl.[2] G01N *21/22;* **G01J** *3/46*

U.S. Cl. 356—203 **7 Claims**



1. In an apparatus for determining the extreme density values of the originals in a strip of photographic originals, of the type provided with evaluating means for receiving an electric signal having a value dependent upon the density of the originals and determining extreme values of the signal, in combination, transport means for transporting the strip in a predetermined travel direction along a predetermined travel path; and electromechanical scanning means operative for scanning each original in direction transverse to said travel direction during travel of the original in said direction using a scanning spot of substantially constant surface area and generating a corresponding electrical signal having a density-dependent value, said scan-

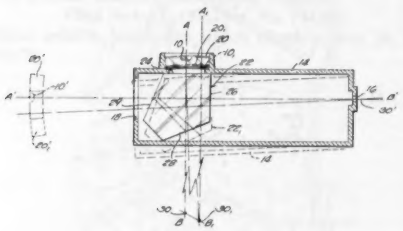
ning means comprising a light source for illuminating the original being scanned, a photoelectric transducer positioned to receive light transmitted from the illuminated original, and beam-shaping means intercepting the path of the light for determining the shape of said scanning spot, said beam-shaping means including a stationary light shield positioned in the path of light from said light source and having a slit extending in direction transverse to said travel direction for establishing the limits of a scan line to be traversed by said scanning spot, and a rotating disk provided with apertures which during rotation of said disk move through the light from said source to define a scanning spot which travels along the scan line established by said slit, said apertures being of equal angular breadth measured relative to the rotation axis of said rotating disk and being equiangularly spaced from one another, the angular spacing between adjoining ones of the apertures of the rotating disk being such that during the transitional time interval at the end of a line scan operation when the scanning spot defined by one aperture reaches and begins to disappear into one end of the scan line the scanning spot defined by the next aperture simultaneously therewith begins to appear at the other end of the scan line, adjoining apertures of the rotating disk accordingly being operative for simultaneously transmitting to the photoelectric transducer the light transmitted through the two ends of the scan line during the transitional time interval, said scanning means comprising means for rotating said disk at such a speed that each scanning spot produced by one of said apertures of said rotating disk travels from one to the other end of said scan line within a time no greater than that in which the strip is transported a distance equal to the breadth of the scanning spot as measured in said travel direction of the strip.

4,082,466

OPTICAL SIGHTING INSTRUMENT

Robert L. Underberg, Mequon, Wis., assignor to Realist, Inc., Menomonee Falls, Wis.

Filed Jun. 14, 1976, Ser. No. 695,764
Int. Cl.² G01C *5/02*
U.S. Cl. 356—249 **7 Claims**



1. An optical sighting instrument comprising,
a housing having a sighting aperture and an objective aperture,
a tubular spirit level mounted on the housing with the transverse centerline of the bubble in the spirit level appearing longer than the centerline parallel to the level axis,
a plurality of reflecting surfaces positioned relative to the level and to one another to reflect light passing through the level to the sighting aperture so the virtual image of the level appears intact in the view from the sighting aperture through the objective aperture and the transverse centerline of the bubble image itself indicates the desired position relative to horizontal regardless of tilt of the instrument and the bubble image moves in the direction indicative of instrument tilt.

4,082,467

MARKER AND VAPORIZABLE DISPERSIBLE DYE INKS AND PROCESS FOR USING SAME

Paul Kaplan, 57 Lee Rd., Livingston, N.J. 07039

Filed Dec. 31, 1975, Ser. No. 645,756
Int. Cl.² B43K *5/00*; C09D *11/00*
U.S. Cl. 401—199 **6 Claims**

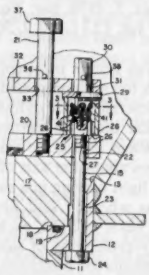
1. The combination consisting of a marker pen suitable for use with a dye dispersion composition, comprising housing means having a chamber therein and an opening means connected with said chamber for transfer of said composition therebetween, an absorptive mass in said chamber for holding and supplying said dye dispersion composition and a line-forming tip closing said end, said line-forming tip having a porosity suitable for feeding said composition at a selected rate to a surface making contact with said tip and a dye dispersion composition comprising a high boiling solvent, a resin dissolved in said solvent and a vaporizable disperse dye suspended in said solvent, the viscosity of said composition being such that said dye will be held indefinitely in suspension and said composition can flow through a felt pen readily.

4,082,468

QUICK RELEASE SLEEVE RETAINED SPLIT NUT-BOLT STRUCTURE

Robert J. von Base, Arlington, Tex., assignor to Oil States Rubber Company, Arlington, Tex.

Filed Jan. 7, 1977, Ser. No. 757,593
Int. Cl.² F16B *37/10*
U.S. Cl. 403—2 **10 Claims**



7. In a quick release structure: a nut and bolt combination with the bolt having bolt threads and the nut being an inter-

nally threaded nut threadingly engaging bolt threads and adjustable for tightening and loosening on said bolt threads; said nut being a segmented nut with a plurality of segments and in nut assembled form having a multi-faced exterior; a sleeve having a multi-faced interior matching the multi-faced exterior of said segmented nut and sized to be a longitudinally sliding fit on said segmented nut for quick release of said nut and bolt by drawing of said sleeve clear of said segmented nut; wherein said sleeve is provided with wrenching surface means by which said segmented nut may be adjusted and tightened; with a plurality of said nut and bolt combinations used in clamping a first structural element and a second structural element together; a lifting plate connected to the sleeve of each segmented nut of said nut and bolt combinations; and lifting means for lifting said lifting plate and each of said sleeves for quick release of said nut and bolt combinations and said first structural element from said second structural element.

4,082,469

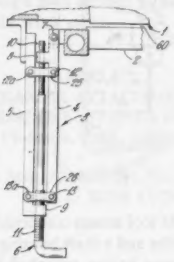
ADJUSTMENT MECHANISM

Alex P. Symborski, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 24, 1977, Ser. No. 761,744

Int. Cl.[2] F16B *7/06*

U.S. Cl. 403—24 **10 Claims**



1. Apparatus comprising:

(a) a first member having a threaded section:

(b) a second member spaced from said first member and having a threaded section, said first member being movably connected to said second member for constrained vertical movement, with a small are in the movement; and

(c) a screw member positioned between said first and said second member, said screw member having upper and lower threaded portions, said upper threaded portion engaging the threaded section of said first member and said lower threaded portion engaging the threaded section of said second member, the threads of said upper threaded portion having a pitch unlike the pitch of the threads of said lower threaded portion and the threads of said upper threaded portion and said lower threaded portion being of the same hand.

4,082,470

CONNECTOR

Heinrich-Albert Alberts, Mondeor, Transvaal, South Africa, assignor to Serbert Industries (Proprietary) Limited, Mondeor, Transvaal, South Africa

Filed Mar. 2, 1977, Ser. No. 773,790

Claims priority, application South Africa, Mar. 12, 1976, 76/1548

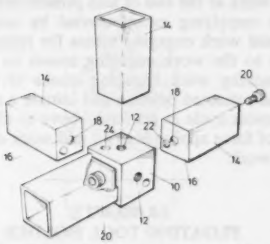
Int. Cl.[2] F16B *2/16*

U.S. Cl. 403—172 **1 Claim**

1. A connector for interconnecting lengths of square tubing to form frameworks comprising, in combination, a three-dimensional central body member having a plurality of facets in each of which is formed a threaded bore, and a plurality of separate connectors adapted to be releasably secured by said bores to selected facets on the body member to provide any one of a number of possible configurations, the connector members in turn being adapted to be releasably connected to the lengths of square tubing, characterized in that:

(a) each connector member is a hollow tube, of square cross section throughout its length and closed at one end by a wall;

(b) a central hole is formed in the end wall of each connector member to accept a screw by means of which the connector member may be secured to the central body;



(c) each connector member is adapted to accommodate the head of the screw within it;

(d) a recess is formed in each facet adjacent its threaded bore and radially spaced therefrom;

(e) the external face of the end wall of each connector member is formed with a complementary protuberance adapted to engage one of the recesses on the central body to prevent rotation of the connector member when secured to the central body.

4,082,471

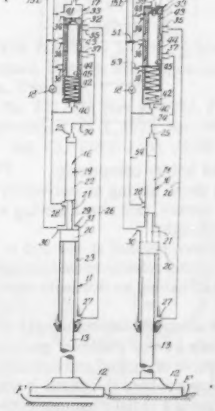
UNIVERSAL HYDRAULIC IMPACT TOOL

Jan A. Hiszpanski, Upland, Calif., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Filed Jan. 2, 1976, Ser. No. 646,151

Int. Cl.[2] E01C *19/35*

U.S. Cl. 404—133 **22 Claims**



1. A reciprocating tool for applying a force to a yieldable work, said tool comprising: a support, a work engaging means carried by said support for reciprocation in forward and reverse directions relative to said support; forward force applying means carried by said support and cooperatively associated with said work engaging means for applying a forward force to

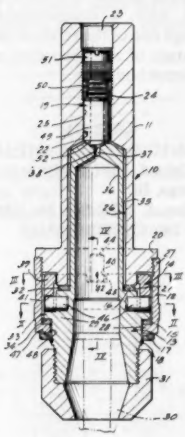
said work engaging means to drive the work engaging means in said forward direction for a preselected time; reverse force applying means carried by said support and cooperatively associated with said work engaging means for applying a reverse force to the work engaging means at the end of said preselected time irrespective of the position of said work engaging means at that time to drive the work engaging means reversely back toward a preselected retracted position, said reverse force applying means including means for decelerating the work engaging means to zero forward speed in the event the work engaging means is continuing to move forwardly against the work at the end of said preselected time; and forward force reapplying means carried by said support and acting on said work engaging means for reapplying the forward force to the work engaging means to decelerate the reversely moving work engaging means to zero rearward speed at said retracted position and initiate a subsequent forward movement cycle as set forth above to effect controlled succession of force applications by said work engaging means against the work.

4,082,472

FLOATING TOOL HOLDER

William Arno Mossner, Frankenmuth, and Gerald Edwin Mueller, Saginaw, both of Mich., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,546
Int. Cl.² B23B *51/06*
U.S. Cl. 408—57 **12 Claims**



1. A floating tool holder comprising:

(a) a supporting shank having an outwardly directed flange near one end thereof, said shank having a bore extending axially therethrough;

(b) an annular sleeve secured at one end to said flange and projecting in spaced relation to said shank beyond said one end thereof, and having an inwardly directed flange at its other end;

(c) a tool chuck assembly having a body aligned with said shank, said body having a tubular portion integral therewith and receptive of tooling and extending into said axial bore of said shank where the shank is adapted to be supported, there being a radial clearance between said tubular portion and said axial bore in said shank, and said tubular portion having an end aperture in said shank bore for conducting coolant from said axial bore into said body, an axially directed surface of said chuck body being adjacent to said one end of said shank, said chuck body having an outwardly directed flange within said annular sleeve adjacent to said sleeve flange for retaining said chuck body;

(d) driver means within said annular sleeve for corotatably connecting said shank to said chuck body and for enabling radial displacement therebetween; and

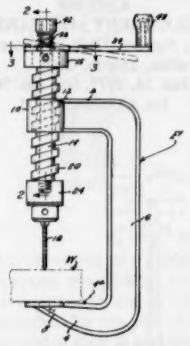
(e) a first annular bearing disposed between and having flat surfaces slidably engaging said flanges on said sleeve and said chuck body, and a second annular bearing disposed between and having flat surfaces slidably engaging said one end of said shank and said axially directed chuck body surface, said flat surfaces of said bearings being a thermal-diffusion of a metal boride.

4,082,473

MANUALLY OPERATED HAND DRILL

Theodore Bratsos, P.O. Box 638, Boston, Mass. 02102

Continuation-in-part of Ser. No. 587,645, Jun. 17, 1975, abandoned. This application Jun. 16, 1976, Ser. No. 689,121
Int. Cl.² B23B *45/06*
U.S. Cl. 408—101 **4 Claims**



1. Manually operable tool means comprising a frame formed with a work piece holder and a shaft housing located in spaced relation to the work piece holder, said shaft housing having an internally threaded bore, a tool supporting adapter sleeve having an external thread engageable with the threaded bore of the tool housing, and said external thread of the adapter sleeve being axially displaceable in the internally threaded bore of the shaft housing, a pressure transmitting collar secured at the upper end of the adapter shaft, a tool shaft rotatably mounted in the adapter sleeve, chuck means secured at one end of the tool shaft against which the bottom of the adapter sleeve is received, the opposite end of said shaft having flat side portions, a tool element detachably supported in the chuck means, a slotted tilting handle member slideably engaged with an opposite upper end of the said tool shaft around said flat side portions thereof for rotating the shaft and tool element, coiled spring means located around said upper end of the shaft resiliently urging the slotted tilting handle against the pressure transmitting collar, said tilting handle being angularly displaceable to form on acute angle with respect to the axis of rotation of the tool shaft to variably compress the coiled spring means and transmit a range of cutting pressures against the transmitting collar and adapter sleeve while the handle is being rotated.

4,082,474

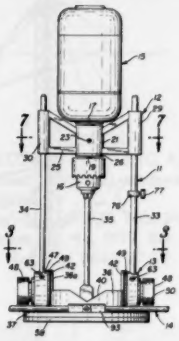
DRILL ATTACHMENT

Darrel E. Stiger, 3831 S. Ames St., Denver, Colo. 80235

Filed Jan. 7, 1977, Ser. No. 757,701
Int. Cl.² B23B *39/00*
U.S. Cl. 408—110 **13 Claims**

1. A position, angle and depth of hole regulating attachment for motor powered hand tool drills that provide a housing enclosing a drive motor and an output shaft for the driving rotation of drill bits that are used for cutting holes in an intended work piece comprising a frame component for attachment to said drill, a plurality of guide sleeves on said frame

disposed parallel to the axis of said output shaft, an open-centered base component for contact with said work piece, rotatably mounted trunnions on said base disposed outwardly from the center thereof, and guide rods for interconnecting said



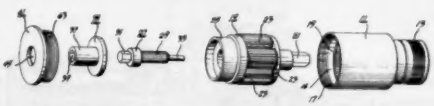
frame and the trunnions of said base component, said trunnions providing means for reciprocally receiving said guide rods whereby the drill and any drill bit attached thereto are reciprocally movable along a path defined by said guide rods toward and away from said work piece.

4,082,475

HIGH SPEED REAMER ATTACHMENT FOR COAXIAL DRIVE FASTENER GUN

Alfred W. Kuder, Placentia, Calif., assignor to Frank A. Klaus, Fullerton, Calif.

Filed Mar. 9, 1977, Ser. No. 776,089
Int. Cl.² B23B *47/04*
U.S. Cl. 408—125 **4 Claims**



1. An attachment for a counter-rotating coaxial drive fastener gun comprising:

A cylindrical housing having a coupling sleeve which is adapted to engage the outer drive member of a coaxial drive fastener gun, said cylindrical housing having an inner cavity within which a ring gear is fixedly attached;

A spider having a projecting end adapted to engage the inner drive member of a coaxial drive fastener gun, said spider having a plurality of identical planetary gears journaled therearound with a central opening between said planetary gears adapted to receive a central drive gear of diameter smaller than the diameter of said planetary gears and which engages each of said planetary gears, said spider and said planetary gears being positioned in said inner cavity of said cylindrical housing such that each of said planetary gears engage said ring gear and said projection end is centrally located within said coupling sleeve;

A central drive gear located within said central opening between said planetary gears of said spider and engaging each of said planetary gears, said central drive gear being adapted to be coupled to a reamer;

A reamer removably connected to said central drive gear; and

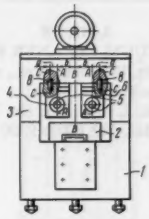
A locking mechanism adapted to be connected to a coaxial drive fastener gun for locking the outer drive member from rotating whereby the inner drive member is free to rotate said spider at the speed of rotation of the fastener gun which, in turn, through said planetary gears rotates said central drive gear and said reamer attached thereto at a higher speed of rotation.

4,082,476

MACHINE FOR PRECISION BORING OPERATIONS

Fridrikh Lvovich Kopelev, ulitsa Komsomolskaya, 43, kv.5, Odessa, U.S.S.R.

Filed Apr. 6, 1977, Ser. No. 785,285
Int. Cl.² B23B *47/00*
U.S. Cl. 408—234 **4 Claims**



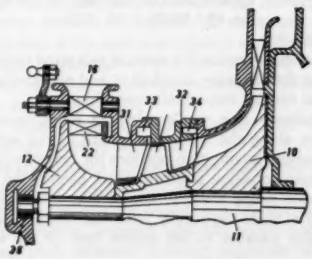
1. A machine for performing high-precision boring operations with compensation for its temperature-induced deformation, comprising: a framework; a work table adapted to have workpieces to be machined secured thereon, movable relative to said framework in the course of a boring operation; a bridge structure having a side facing said work table, mounted on said framework and having an axis of symmetry; a spindle head with a spindle having its geometrical axis; the housing of said spindle head, attached to said side of said bridge structure, facing said work table, so that the axis of the spindle of said spindle head is offset with respect to the axis of symmetry of said bridge structure; pins adapted to retain the position of said housing of said spindle head relative to said side of said bridge structure, facing said work table, pressure-fitted in said housing of said spindle head and arranged in said housing so that a plane including the geometrical axes of said pins is offset with respect to a parallel plane, including the axis of said spindle, in a direction opposite to that toward the axis of symmetry of said bridge structure.

4,082,477

COMPRESSOR HAVING TWO OR MORE STAGES

Sven-Olof Kronogard, Lomma, Sweden, assignor to United Turbine AB & Co., Sweden

Division of Ser. No. 521,540, Nov. 6, 1974, Pat. No. 3,941,499.
This application Dec. 1, 1975, Ser. No. 636,653
Int. Cl.² F01D *1/08, 13/00*
U.S. Cl. 415—120 **4 Claims**



1. A multi-stage compressor including a first rotor having a peripheral inlet and a central outlet;

a second rotor having a central, annular inlet and a peripheral outlet;

a common shaft mounting said first and second rotors;

third rotor of the axial flow type having a hub portion fitted upon said common shaft, between said first and second rotors; and

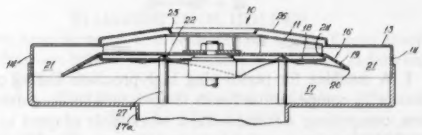
a housing enclosing said first, second and third rotors, and forming, together with said rotors, a passage-way for the fluid to be compressed, said passage being defined outwardly by said housing and inwardly by said rotors, said passage-way comprising means permitting flow substantially radially inwards past said first rotor, and substantially radially outwards past said second rotor.

4,082,478

VACUUM CLEANER FAN

Joseph Francis Schmitz, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 2, 1976, Ser. No. 702,284
Int. Cl.[2] F01D 9/00
U.S. Cl. 415—209 **16 Claims**



1. In an air moving apparatus having a housing defining an inlet and a discharge portion provided with corner portion and defining an outlet, and rotatable air moving means in said housing inwardly adjacent said discharge portion for moving air delivered from said inlet in a radial direction for flow longitudinally outwardly through said discharge portion outlet, the improvement comprising

wall means having a midportion extending transversely across said housing at said discharge portion for preventing air flow directly longitudinally outwardly from said air moving means to said outlet and directing said air flow laterally outwardly in said housing, said wall means further defining with said housing corner portions flow restricting air flow passages for conducting the laterally directed air from said air moving means longitudinally outwardly through said passages to be discharged through said discharge portion outlet.

4,082,479

OVERSPEED SPOILERS FOR VERTICAL AXIS WIND TURBINE

Rajindar S. Rangi, and Peter South, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

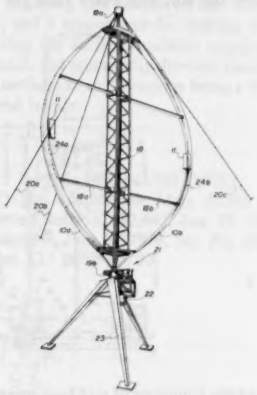
Filed Jul. 21, 1976, Ser. No. 707,205
Claims priority, application Canada, Sep. 25, 1975, 236421
Int. Cl.[2] F03D 3/06, 7/06
U.S. Cl. 416—23 **7 Claims**

1. An overspeed spoiler for vertical axis wind turbines of the type having airfoil blades attached to and mounted outwardly of a vertical turbine rotor shaft comprising:

(a) a relatively thin spoiler element hinge mounted at a position along the span-wise length of the airfoil blade, said element having two portions the first of which is held in a closed position generally flush against the surface of the airfoil blade towards the turbine rotor axis and the second extends outwardly from the hinge mounting and generally parallel to the center line of the said airfoil blade,

(b) spring means attached to said element and to the airfoil blade and biased such as to hold the spoiler element in the closed position, and

(c) the weight and configuration of the element and the spring strength being such that at a predetermined rotor speed the element rotates against the spring bias force because of centrifugal action and takes up an open position



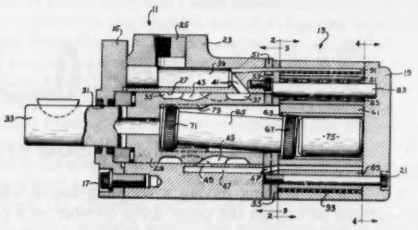
with both portions generally transverse to the air flow direction such as to cause much increased drag and provide control of overspeeding of the turbine rotor.

4,082,480

FLUID PRESSURE DEVICE AND IMPROVED GEROLER ® FOR USE THEREIN

Hugh L. McDermott, Edina, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 23, 1976, Ser. No. 716,911
Int. Cl.[2] F04B 49/00; F04C 1/02
U.S. Cl. 417—283 **21 Claims**



1. A rotary fluid pressure device, comprising:

(a) housing means defining a fluid inlet port and a fluid outlet port;

(b) an internally-toothed assembly fixedly disposed within said housing means;

(c) an externally-toothed member eccentrically disposed within said internally-toothed assembly for relative orbital and rotational movement therebetween;

(d) said internally-toothed assembly including a plurality of internal teeth, said internal teeth and said external teeth interengaging to define a plurality of expanding and contracting volume chambers during said relative movement;

(e) said housing means and said internal teeth cooperating to define a fluid chamber disposed radially therebetween, extending circumferentially about said fluid pressure device, said fluid chamber being in fluid communication with one of said fluid inlet port and said fluid outlet port; and

(f) check valve means operatively disposed between each adjacent pair of internal teeth, each check valve means including a movable check valve member normally biased radially inwardly into contact with each of said pair of

adjacent internal teeth and being operable to permit fluid to pass therethrough, into said fluid chamber, when fluid pressure in the adjacent volume chamber is greater than the fluid pressure in said fluid chamber.

4,082,481

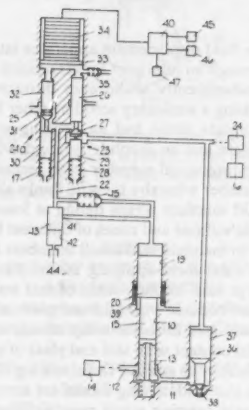
FUEL INJECTION PUMPING APPARATUS

Ivor Fenne, Greenford, England, assignor to CAV Limited, Birmingham, England

Continuation of Ser. No. 660,927, Feb. 24, 1976, abandoned. This application Feb. 14, 1977, Ser. No. 768,377

Int. Cl.[2] F04B *17/00*

U.S. Cl. 417—403 **6 Claims**



1. A fuel injection pumping apparatus comprising in combination a displacement piston located within a cylinder, an outlet from one end of the cylinder, a fluid pressure operable member mounted within a further cylinder for actuating said piston and causing fuel to be delivered through said outlet, means operable upon movement of the piston to a predetermined position in said cylinder during delivery of fuel through said outlet by the piston, to terminate flow of fuel through the outlet and valve means operable to place an end of said further cylinder in communication with a source of fluid under pressure to effect movement of the displacement piston in a direction to deliver fuel through said outlet, or with a drain to permit return motion of the piston, an adjustable orifice disposed intermediate said valve means and said one end of said further cylinder, said adjustable orifice acting to control at least the initial flow of fluid to said one end of said further cylinder thereby to control the rate of fuel supply through said outlet, and a non-return valve disposed in parallel with said orifice, said non-return valve being arranged to permit substantially unrestricted flow of liquid out of said end of the further cylinder, and in which said adjustable orifice is defined by a port formed in the wall of an additional cylinder, said port communicating with said one end of said further cylinder, an inlet to one end of said additional cylinder, and through which liquid can flow to said further cylinder by way of the port when said valve means is operated to cause delivery of fuel, a piston in said additional cylinder said piston being subjected at one end to the pressure of liquid at the inlet of the additional cylinder, said piston determining the effective size of said port and means for limiting the rate of movement of the piston in the direction to increase the effective size of said port.

4,082,482

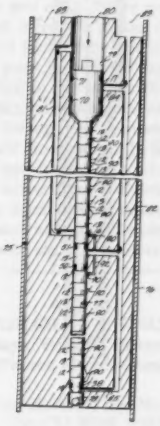
ARTICULATED TURBINE PUMP

John W. Erickson, Huntington Beach, and Harold L. Petrie, Pasadena, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed Jan. 21, 1977, Ser. No. 761,367

Int. Cl.[2] F04B *47/14*

U.S. Cl. 417—408 **37 Claims**



1. Articulated fluid machinery comprising:

a flexible shaft;

a plurality of rotor elements and a plurality of stator elements mounted about the shaft in adjacent, alternating relationship, the elements having connecting passages for fluid flow generally along the shaft;

an inlet at one end of the elements for introduction of fluid flowing through the passages of the elements;

an outlet at the other end of the elements for removal of fluid flowing through the passages of the elements;

each rotor element having one or more rotatable blades attached to the shaft and oriented to intercept fluid flowing through its passage and a housing segment surrounding the one or more rotatable blades and spaced outwardly therefrom to provide clearance for rotation of the one or more rotatable blades;

each stator element having one or more stationary blades unattached to the shaft and oriented to direct fluid flowing through its passage toward the rotatable blades, and a housing segment surrounding and attached to the one or more stationary blades;

journal bearing means supporting the shaft for rotation within the housing segments;

thrust bearing means supporting the shaft axially within the housing segments and permitting the shaft to shift axially relative to the housing segments when the shaft bends;

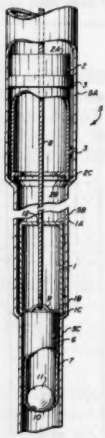
interfacing means between adjacent housing segments for sealing such adjacent housing segments when axially aligned, the interfacing means permitting such adjacent housing segments to pivot out of axial alignment when the shaft bends; and

means for preventing axial rotation between the housing segments.

4,082,483
OIL WELL PUMP

Alfred Paul Sprenger, 7630 N. 4th Ave., Phoenix, Ariz. 85021

Continuation-in-part of Ser. No. 592,116, Jul. 1, 1975, abandoned. This application Aug. 24, 1976, Ser. No. 717,199
Int. Cl.² E21B 27/00; F04B 21/04
U.S. Cl. 417—554 6 Claims

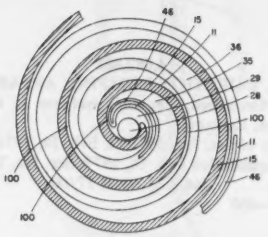


1. A pump for operation in a well casing comprising:
a plunger,
a first plunger extension,
said plunger comprising an open ended hollow cylinder,
one end of said cylinder being provided for attaching to a cable,
the other end of said cylinder being provided with a valve seat interiorally thereof,
a ball captured within said cylinder for movement longitudinally thereof for seating in said valve seat during movement of said cylinder in one direction in a well casing for closing said other end of said cylinder,
said extension comprising a hollow cylindrical member mountable in a well casing at a level above said plunger and substantially closed at its upper ground level end of the well casing and open at its other end,
said closed end provided with a cable bearing aperture for receiving the cable passing from said plunger through its hollow interior and bearing aperture on the way to the top of the well casing, and
a second extension similar to said first extension but of a larger diameter than said first plunger extension and operable in a section of the well casing of a larger diameter than the section of the well casing operated in by said first extension,
whereby movement of said plunger toward the ground surface end of the well casing causes the upstream end of said plunger to frictionally engage the downstream end of said first extension and to move in unison with said first extension upwardly in the well casing until the closed end of said first extension frictionally engages the open end of said second extension capturing fluid within its hollow interior and to then move in unison with said first and second extensions upwardly toward the ground level in the well casing.

4,082,484
SCROLL-TYPE APPARATUS WITH FIXED THROW CRANK DRIVE MECHANISM

John E. McCullough, Carlisle, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Jan. 24, 1977, Ser. No. 761,889
Int. Cl.² F04C 17/02, 29/10
U.S. Cl. 418—55 19 Claims



1. In a positive fluid displacement apparatus into which fluid is introduced through an inlet port for circulation through said apparatus and subsequently withdrawn through a discharge port, and comprising a stationary scroll member having an end plate and an involute wrap and an orbiting scroll member having an end plate and an involute wrap, driving means for orbiting said orbiting scroll member with respect to said stationary scroll member whereby the side flanks along with said end plates of said involute wraps define at least-one moving pocket of variable volume and zones of different fluid pressure, coupling means to maintain said scroll members in fixed angular relationship, axial force-applying means for providing an axial force to urge said involute wrap of said stationary scroll member into axial contact with said end plate of said orbiting scroll member and said involute wrap of said orbiting scroll member into axial contact with said end plate of said stationary scroll member thereby to achieve radial sealing of said pockets, characterized in that said driving means are arranged to effect the orbiting of said orbiting scroll member such that a small clearance is maintained between said side flanks of said wrap thereby to essentially eliminate wear of said side flanks over extended periods of operation while retaining the essential integrity of said zones of different fluid pressure.

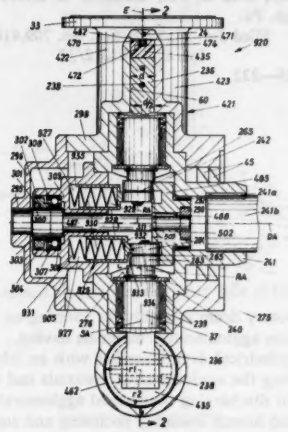
4,082,485
ROTARY VANE-TYPE PUMP

Manfred Sommer, Baden-Wurttemberg, Germany, assignor to Helmut Wolf, Germany

Filed Dec. 7, 1976, Ser. No. 748,226
Claims priority, application Germany, Dec. 8, 1975, 2555172
Int. Cl.² F04C 1/00
U.S. Cl. 418—226 7 Claims

1. A rotary pump comprising a housing defining an annular passageway and a rotor rotatably mounted in said housing coaxially with said passageway, said rotor comprising a central hollow hub portion and a plurality of vanes carried by the hub portion and disposed in said passageway for movement therein in a circular path, said vanes having the form of flat circular discs on the outer ends of shafts rotatable in said hub portion about axes disposed radially of the axis of said rotor, said passageway of said housing having a pumping portion which is of circular cross section with a diameter equal to the diameter of said circular vanes and a sealing portion of a cross section corresponding to a dimetrical cross section of said vanes with an inlet and an outlet respectively at opposite ends of said sealing portion and means for controlling rotary movement of said shafts to position said vanes orthogonally to said passageway in the pumping portion thereof and in line with said passageway in the sealing portion thereof, said control means comprising an eccentric inward extension of each of said shafts, a cam follower on each of said eccentric shaft exten-

sions, a stationary annular cam concentric with the axis of said rotor and having a single cam surface engageable with said cam follower on one side only thereof and biasing means for urging said cam follower against said cam surface, said biasing

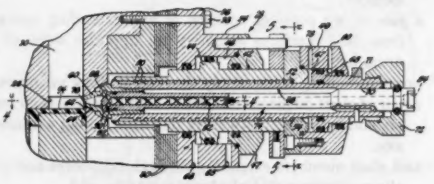


means for each vane comprising a bias applying element on said eccentric shaft portion separate from said cam follower and spring means acting between said bias applying element and a fixed seat portion of said hub.

4,082,486
APPARATUS FOR IN-THE-MOLD COATING OF MOLDED ARTICLES

Leon R. Cerano, Warren, and Mayo M. Reichardt, Milford, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1976, Ser. No. 746,864
Int. Cl.[2] B29F *1/06*
U.S. Cl. 425—129 R **4 Claims**

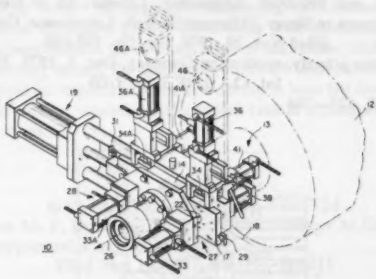


1. Apparatus for molding an article and subsequently coating one surface of such molded article, said apparatus comprising a pair of relatively movable die members which when closed form a cavity wherein an article is molded in a desired configuration, means operatively associated with said die members for moving said die members towards and away from each other into open and closed positions respectively, a chamber formed in one of said die members that communicates with said cavity and is adapted to receive a metered amount of liquid coating material, a plunger reciprocably mounted in said chamber, in inlet port formed in said one of said die members that connects with said chamber, means carried by said one of said die members and connected to the plunger for moving said plunger between a first position wherein said inlet port and said chamber communicate with said cavity and a second position wherein the plunger closes said chamber and said port from communication with said cavity, an injector device for supplying said metered amount of liquid coating material to said chamber, said injector device being carried by said one of said die members and having a body portion provided with connected concentric outer and inner sleeve members, the inner and outer sleeve members each having inner and outer ends, the inner end of the inner sleeve member being formed with a nozzle that is movable into said inlet port so as to permit said injector device to supply said metered amount of liquid coating material to said chamber when said plunger is in said first position, a feeder tube located in said inner sleeve member for said liquid coating material and having one end thereof formed with a head positioned adjacent said nozzle and the other end extending beyond the outer end of said outer sleeve member, a passage formed in said feeder tube that opens at one end adjacent said head, a static mixer located in said passage adapted to mix said liquid coating material as it flows through said passage towards said head, means connected to said outer sleeve member for retracting said nozzle from said inlet port when said plunger is in said second position, an end cap member secured to said outer end of said outer sleeve member and having an annular bore formed therein, a piston member connected to said other end of said feeder tube and located in said annular bore, and a pair of ports in said end cap member adapted to direct pressurized fluid to one side or the other of said piston member so as to selectively cause said head to open and close the nozzle so when the nozzle is open and located in said inlet port in said one of said die members the liquid coating material will flow through said feeder tube into said chamber after which said plunger moves from said first position to said second position and the liquid coating material in said chamber is supplied under pressure to said cavity onto said one surface of the molded article with said die members closed.

4,082,487
APPARATUS FOR CHANGING SCREEN DEVICES

Willard Emanuel Rapp, Franklin Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,148
Int. Cl.[2] B29F *3/00*
U.S. Cl. 425—135 **7 Claims**



1. Apparatus for changing screen devices, which apparatus is adapted for use with a plastics extrusion mechanism having a discharge end, the apparatus comprising:

a slide assembly housing adapted for mounting at the discharge end of the plastics extrusion mechanism and including a slide chamber, the slide assembly housing having an inlet opening and an outlet opening disposed along opposite surfaces of the slide chamber in linear alignment along a discharge direction, which discharge direction is disposed perpendicularly to an axis of elongation of the slide chamber, in such manner that an extruded plastic material discharged along said discharge direction from the plastics extrusion mechanism, at the discharge end of which the apparatus is adapted for mounting, may enter said inlet opening, advance through the slide chamber perpendicularly to said slide chamber axis, and exit through said outlet opening;

a slide assembly slidably movable within said slide chamber along said slide chamber axis and including first and second apertured recesses at respective first and second

spaced locations therealong for receiving a first screen device and a second screen device, respectively, therein, said first recess being located in alignment with said discharge direction between said inlet and outlet openings of the slide chamber in a first position of the slide assembly, and said second recess being located in alignment with said discharge direction between said inlet and outlet openings of the slide chamber in a second position of the slide assembly;

first, operatively associated with the slide assembly, means for sliding the slide assembly alternatingly between said first and second positions of the slide assembly;

second means, responsive to the slide assembly entering into said first position of the slide assembly, for generating a screen-change signal;

ejection means, responsive to said screen-change signal, for ejecting a used screen device from said second recess;

a screen device carrier slidably movable adjacent to said slide chamber so as to bring a new screen device into alignment with said second recess in said first position of the slide assembly;

additional sliding means operatively associated with said screen device carrier for so sliding said screen device carrier as to align said new screen device with said second recess in said first position of the slide assembly; and

introducing means, operated with said new screen device aligned with said second recess in said first position of the slide assembly, for introducing said new screen device into said second recess from said screen device carrier.

4,082,488

APPARATUS FOR THE EXTRUSION OF TEMPERATURE SENSITIVE THERMOPLASTICS

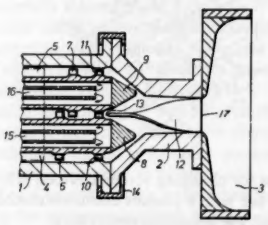
Franz-Jürgen Brinkschröder, Cologne; Axel Sandquist, Langenfeld, and Friedrich Johannaber, Lohmar, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 29, 1976, Ser. No. 745,938

Claims priority, application Germany, Dec. 5, 1975, 2554712

Int. Cl.² B29F *3/06, 3/08*

U.S. Cl. 425—204 **4 Claims**



1. An apparatus for the extrusion of thermoplastics, comprising a housing having an outlet and two contra-current rotatable screws arranged therein each having a core with the free ends of the cores of the screws disposed downstream of the termination of the screw threads, a deflection element disposed around each core and staggered in the direction of flow in relation to each to each other, and downstream of the deflection elements a toothed wheel disposed around each core and aligned to mesh with each other to effect a combing function, and an adaptor connected to the outlet of the housing, and having an outlet and a planar guide plate disposed therein and twisted through approximately 90° and having a straight input edge disposed between the two screws arranged substantially at right angles to the plane passing through the axes and an output edge at the outlet of the adaptor.

4,082,489

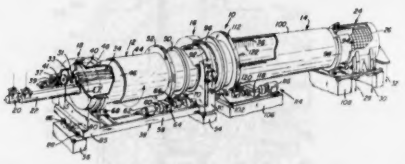
PIVOT ARRANGEMENT FOR A ROTARY DRUM ASSEMBLY

Harry James Kent, Pittsburgh, and Arthur Jacob Pietrusza, McMurray, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1976, Ser. No. 709,418

Int. Cl.² B01J *2/12*

U.S. Cl. 425—222 **4 Claims**



1. In a rotary drum assembly for forming an agglomerated product from agglomerative materials having,

a first cylindrical drum member with an inlet portion for receiving the agglomerative materials and an outlet portion for discharging the formed agglomerated product,

a feed end breech assembly enclosing and sealing said first cylindrical drum member inlet portion,

a second cylindrical drum member with an inlet portion for receiving the agglomerated product from the first drum member and a discharge portion for discharging the agglomerated product,

said first drum member outlet portion extending into said inlet portion of said second drum member,

a center breech assembly surrounding and sealing said first drum member outlet portion and said second drum member inlet portion,

a discharge end breech assembly surrounding and sealing said second cylindrical drum member discharge end portion, the improvement comprising;

a platform assembly positioned below one of said drum members for pivotally and rotatably supporting said drum member,

a pair of leg portions secured to and extending upwardly from said platform assembly on opposite sides of said drum member,

bores extending transversely through said leg members,

a pair of shaft members secured to said center breech assembly and extending outwardly therefrom along a transverse axis,

said shaft members extending through said bores and pivotally supporting said platform assembly, and

power actuated means operatively associated with said platform assembly for pivoting said platform assembly about said shaft members to thereby pivot drum member supported thereon relative to the other of said drum members and thereby control the rate of flow of the agglomerative materials through that drum member.

4,082,490

APPARATUS FOR MOLDING A TIRE MOLDING BLADDER

Jacques Chateau, Chatel-Guyon, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Dec. 22, 1976, Ser. No. 753,606

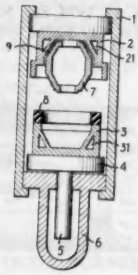
Claims priority, application France, Jan. 2, 1976, 76 00047

Int. Cl.² B29C *17/00;* B29H *5/18;* B29C *3/00*

U.S. Cl. 425—412 **3 Claims**

1. A press for manufacturing a sleeve which is invertible into a resulting elastic bladder for use in a tire molding and vulcanization press, said sleeve press having a core and two shells

which can be joined to each other, characterized by the fact that the outer wall of the core has raised elements in relief for



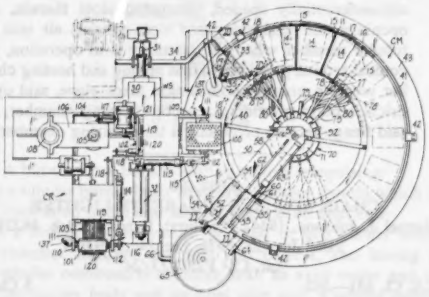
producing recessed elements in the inner face of the invertible sleeve.

4,082,491

AUTOMATED MOLDING MACHINE

Wilbur L. Clymer, Phillipsburg, N.J., and Charles J. Klara, Bethlehem, Pa., assignors to Binney & Smith Inc., Easton, Pa.

Division of Ser. No. 512,545, Oct. 7, 1974, Pat. No. 3,957,408.
This application Jan. 19, 1976, Ser. No. 650,016
Int. Cl.² B29C *5/00, 7/00*
U.S. Cl. 425—440 **8 Claims**



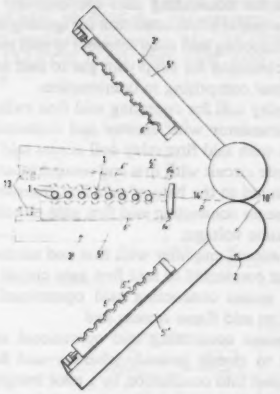
1. In a molding machine, a horizontally rotatable mold table containing a plurality of compartments disposed in an annular array, a plurality of mold tubes traversing vertically each compartment, fluid supply and return conduit means connected to each compartment, and a fluid distributing manifold traversed by passages communicating with said conduit means, said fluid distributing manifold having a first portion rotatable with said mold table and a second portion which is fixed relative to said first portion, a plurality of pairs of heating and cooling fluid supply and return passages in said first manifold portion juxtaposed to the respective compartments, means connecting said fluid supply and return passages of each pair to the fluid supply and return conduit means, respectively, of different adjacent compartments, and transfer passages in said second manifold portion which are arranged for communication with said fluid supply and return passages for connecting each of certain paired ones of said fluid supply and return passages together.

4,082,492

MOLD CLOSING APPARATUS

Manfred Kurreck, Bochum-Weitmar, Germany, assignor to Holstein und Kappert Aktiengesellschaft, Dortmund, Germany

Filed Jun. 3, 1976, Ser. No. 693,120
Claims priority, application Germany, Jun. 6, 1977, 2525161
Int. Cl.² B29C *1/00, 1/16*
U.S. Cl. 425—451 **5 Claims**



1. A molding apparatus comprising:

extruding means for forming an extrusion lying on a mold plane;

a pair of mold halves engageable together at said plane and having respective registrable mold cavities engageable at said plane around said extrusion;

respective pivots for said halves spacedly flanking said plane

closing means for angularly displacing said halves about their respective pivots for closing said halves together scissor-fashion on said extrusion at said plane; and,

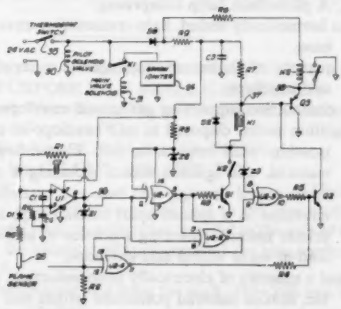
centering means for displacing each of said halves away from its respective pivot axis during at least the last stages of closing, whereby said cavities remain centered on said extrusion.

4,082,493

GAS BURNER CONTROL SYSTEM

Vincent M. F. Dahlgren, Pomona, Calif., assignor to Cam-Stat Incorporated, Los Angeles, Calif.

Filed Jan. 19, 1977, Ser. No. 760,811
Int. Cl.² F23Q *9/08*
U.S. Cl. 431—25 **16 Claims**



1. In a pilot ignition and valve control system for a gas

burner having a main burner, a main valve operated by a main solenoid for providing gas to said main burner, a pilot burner, a pilot valve operated by a pilot solenoid for providing gas to said pilot burner, a spark igniter circuit, ignition electrodes and a flame sensor adjacent said pilot burner, a pair of input terminals for connection to a power source through a thermostat switch and for connection to said pilot solenoid whereby said pilot solenoid is energized and gas is supplied to said pilot burner when the thermostat switch is closed, and a first switching circuit for connecting said spark igniter circuit to said terminals when in a first condition for igniting said pilot burner and for connecting said main solenoid to said terminals when in a second condition for supplying gas to said main burner, the improvement comprising in combination:

a first relay coil for operating said first switching circuit;

a first transistor with emitter and collector connected in series with said first relay coil across said terminals;

a first gate circuit with first and second inputs and an output connected to the base of said first transistor;

a first means connecting said first gate circuit first input to a reference voltage;

an operational amplifier with first and second inputs and an output connected to said first gate circuit second input;

second means connecting said operational amplifier first input to said flame sensor; and

third means connecting said operational amplifier second input to circuit ground, whereby said first transistor is switched into conduction by a pilot burner flame energizing said first relay coil and supplying gas to said main burner.

4,082,494

PHOTOFLASH LAMP

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 8, 1976, Ser. No. 748,628
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—95 R 10 Claims

1. A photoflash lamp comprising:

an hermetically sealed, light-transmitting envelope having a base;

a quantity of filamentary combustible material located with said envelope;

a combustion supporting gas in said envelope;

ignition means disposed in said envelope in operative relationship with respect to said filamentary combustible material, said ignition means including a pair of lead-in wires sealed through said base and extending inside said envelope in a spaced apart relationship, and a mass of primer material covering a portion of at least one of said lead-in wires within said envelope;

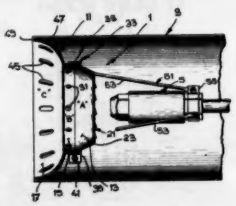
and a quantity of electrically nonconducting, non-combustible, fibrous material positioned within said envelope near said base thereof and around at least one of said lead-in wires to reduce the possibility of shorting between said wires.

4,082,495

FLAME RETENTION HEAD ASSEMBLY

Denis Lefebvre, 3354 rue Windsor, app. 4, St.-Hubert, Quebec, Canada

Filed Feb. 17, 1976, Ser. No. 658,745
Int. Cl.[2] F23M *9/00*
U.S. Cl. 431—183 8 Claims



1. A three-stage flame retention head assembly for use in the air tube of a fuel burner having a fuel nozzle mounted coaxially within the air tube, said assembly comprising:

(a) a tubular member concentrically mounted within said air tube just in front of the fuel nozzle, said tubular member comprising a conical section, a cylindrical section joined at one end thereof to the larger end of said conical section, and an outwardly flaring flage section joined at the smaller end thereof to the other end of said cylindrical section, said outwardly flaring flange section being dished to provide a convex outer surface;

(b) a spinner plate mounted in the smaller end of said conical section of said tubular member and adapted to mix and swirl air and fuel, said spinner plate having a central opening therein defined by a continuous annulus, and having vanes in its outer periphery extending outwardly from said continuous annulus;

(c) said cylindrical section of said tubular member having circumferentially spaced openings therein; and

(d) said outwardly flaring flange section having a row of circumferentially spaced, elongated slots therein, said openings and said elongated slots passing air into the tubular member when the assembly is in operation, said conical section providing a first mixing and heating chamber wherein primary combustion takes place, said cylindrical section providing a second mixing chamber, and said flange section providing a third mixing chamber.

4,082,496

CHAIN SECURED CIGARETTE LIGHTER

Manuel J. Johnson, 18442 Pinehurst, Detroit, Mich. 48221

Filed Jun. 23, 1976, Ser. No. 699,079
Int. Cl.[2] F23D *13/24*
U.S. Cl. 431—343 5 Claims

1. In combination, a cigarette lighter of a size to fit within a pocket of a vest and having a cover normally enclosing the flame area of the lighter, a flexible chain connected at one end to a part of the lighter remote from the cover and provided at

the other end with means for attachment to an object of a size to fit within a pocket of a vest, said chain having a length such that after being passed through one of the bottom holes of the vest and with the object attaching end reposing in a pocket of the vest the opposite lighter attached end of the chain may be extended to a position adjacent to the mouth of the wearer of the vest where the lighter may be used to light a cigarette held in the mouth of the wearer; and

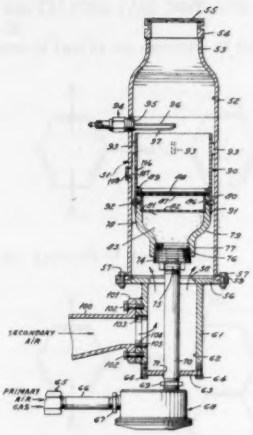
wherein the cigarette lighter has a fuel inlet into the lighter located remote from the flame area enclosing cover and sealed by a removable cap, and wherein the cigarette lighter attached end of the chain is connected directly to the removable cap for the fuel inlet of the lighter.

4,082,497

HIGH CAPACITY QUIET BURNER FOR HOT AIR HEATING SYSTEM

Duncan J. Crawford, Franklin, and Gonzalo D. Santiago, Union Lake, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 29, 1976, Ser. No. 671,685
Int. Cl.² F23D *15/00*
U.S. Cl. 431—158 **18 Claims**



1. A burner for a hot air heating system comprising:

(a) a tubular burner body having a chamber therein which is open at an outlet end and enclosed at an inlet end;

(b) a burner nozzle means mounted in said burner body chamber adjacent the inlet end thereof, and having a tubular combustion chamber with an axial outlet end in the burner body and an axial inlet end, a screen means over the outlet of said burner nozzle and a perforated plate spaced upstream of said screen, said tubular combustion chamber mounted about the outlet of said nozzle means;

(c) means for conveying a prior mixed, mixture of primary air and fuel axially into said burner nozzle means at the inlet end thereof.

(d) means for igniting said mixture of primary air and fuel in said burner; and,

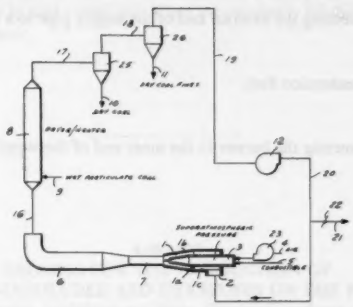
(e) a source of our above atmosphere pressure and means connected to said source for conveying secondary air under pressure into said burner body chamber for flow of all the secondary air around said burner nozzle and tubular combustion chamber and axially past the outlet end of the burner nozzle means and tubular combustion chamber for heating said secondary air, and through said burner body chamber for mixing with the combustion gases formed by the combustion of said prior mixed, mixture of primary air and fuel in said tubular combustion chamber, and for subsequent discharge through the outlet end of said burner body chamber onto an object for heating the same.

4,082,498

SYSTEM FOR DRYING AND HEATING PARTICULATE COAL

Egon Offergeld, Krefeld-Verberg, and Martin Wischniewski, Krefeld-Uerdingen, both of Germany, assignors to Buttner-Schilde-Haas Aktiengesellschaft, Krefeld, Germany

Filed Mar. 10, 1976, Ser. No. 665,380
Claims priority, application Germany, Mar. 12, 1975, 2510737
Int. Cl.² F27B *15/00*; F26B *3/08, 3/10*
U.S. Cl. 432—14 **10 Claims**



1. A system for drying and heating coal, said system comprising in combination:

conduit means forming a generally closed circulation path having a drying station and a mixing station;

blower means in said path for circulating a drying gas under superatmospheric pressure around said path;

means for introducing said coal into said drying station in said path and for withdrawing said coal therefrom after contacting said drying gas, whereby said coal is dried by said drying gas;

burner means for burning a combustion-supporting gas and a combustible at superatmospheric pressure and thereby producing a hot dry combustion gas under superatmospheric pressure;

injector means at said mixing station having a first inlet connected to said path downstream of said drying station, a second inlet connected to said burner means and receiving said combustion gas therefrom, and an outlet for mixing said drying gas circulating in said path with said hot dry combustion gas of said burner means at said mixing station; and

a diffuser in said path between said outlet and said drying station.

4,082,499

MULTIPURPOSE KILN SHELL GAS BURNER

Eugene F. Rossi, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 12, 1976, Ser. No. 741,500
Int. Cl.² F27D *7/00*; F27B *7/36*
U.S. Cl. 432—19 **7 Claims**

4. A method of supplying air and fuel to the combustion chamber of a rotary kiln in a direction parallel to the axis of the chamber from the exterior circumference of the kiln comprising the steps of:

inserting a shell burner pipe from the shell of the kiln into the combustion chamber;

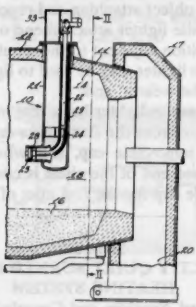
providing the inner extending end of the shell burner pipe with a nozzle to project in a direction parallel to the axis of the combustion chamber;

supporting a ring burner within the nozzle for axial position movement relative to the nozzle;

inserting a supply pipe into the shell burner pipe from the shell of the kiln;

connecting the external end of the supply pipe to a source of combustion fuel;

connecting the burner to the inner end of the supply pipe to gradually change the path of flow of the combustion fuel at the end of the supply pipe adjacent to the burner;



connecting the shell burner pipe to a source of combustion air to flow the combustion air around the burner within the nozzle into the combustion chamber.

4,082,500

PROCESS FOR IMPARTING WRINKLE RECOVERY TO COTTON FABRICS WITH VAPORS FROM GLYCIDOL

Truman L. Ward, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 6, 1977, Ser. No. 794,595
Int. Cl.[2] D06M *13/00, 1/00*
U.S. Cl. 8—120 10 Claims

1. A process for imparting improved wet and dry wrinkle recovery to fabric containing cellulosic fibers comprising

(a) modifying said fibers with diethylaminoethyl or carboxymethyl groups, and thereafter

(b) reacting said groups with glycidol vapor to form cross-links between said carboxymethyl groups or between said diethylaminoethyl groups.

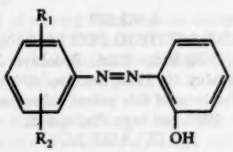
4,082,501

MIXTURES OF OIL-SOLUBLE PHENYL- AND NAPHTHYL-AZO-PHENYL DYESTUFFS

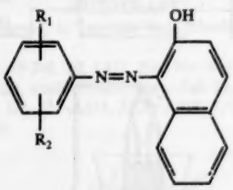
Bernhard Mees, Konigstein, Taunus, and Joachim Ribka, Offenbach am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 20, 1972, Ser. No. 308,003
Claims priority, application Germany, Nov. 20, 1971, 2157609
Int. Cl.[2] C10L *1/10;* D06P *1/00, 3/00*
U.S. Cl. 8—26 8 Claims

1. A mixture of two to ten dyestuffs of the formula



and two to ten dyestuffs of the formula



wherein R_1 and R_2 each is hydrogen, lower alkyl or lower alkoxy.

4,082,502

PROCESS FOR THE DYEING OF SYNTHETIC OR NATURAL FIBERS

Hans-Ulrich von der Eltz, Frankfurt am Main; Albert Reuther, Schwalbach, Taunus, and Hans-Joachim Wassmuth, Hattersheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 553,557, Feb. 27, 1975, abandoned, Ser. No. 442,819, Feb. 15, 1974, abandoned, Ser. No. 442,818, Feb. 15, 1974, abandoned, Ser. No. 442,813, Feb. 15, 1974, abandoned, and Ser. No. 396,515, Sep. 12, 1973, abandoned. This application Aug. 26, 1976, Ser. No. 718,098
Claims priority, application Germany, Jun. 22, 1973, 2331669; Nov. 17, 1973, 2357476; Nov. 17, 1973, 2357447; Nov. 17, 1973, 2357439; Mar. 1, 1974, 2409727
Int. Cl.[2] D06P *1/00;* D06B *9/02, 15/00*
U.S. Cl. 8—34 14 Claims

1. In a process for the dyeing of textile materials in the form of wound bodies according to the exhaust method at temperatures ranging at or above 100° C, in which process the wound bodies contained in a pressure-tight dyeing vessel are heated as well as deaerated before the actual dyeing operation and subsequently contacted with the dyeing liquor which has been separately heated to about dyeing temperature in a pressure-tight batch vessel, placed under a relative excess pressure of from 2.94 to 9.81 bars and then transferred in its total amount from said batch vessel into said dyeing vessel, and in which the dyeing operation is completed by circulation of the dyeing liquor, the improvement which comprises: exposing the wound bodies to an atmosphere of steam at about dyeing temperature prior to contact with the dyeing liquor in order to preheat and de-aerate said textile materials; and transferring the dyeing liquor by means of said relative excess pressure and towards the pressure of the air-free atmosphere of the steam into the dyeing vessel, simultaneously from both the inside and the outside of said wound bodies, thereby entirely condensing the steam in said vessel and filling it completely by the transferred liquor.

4,082,503

PROCESS FOR THE PRODUCTION OF WATER-INSOLUBLE AZO DYESTUFFS ON THE FIBER

Hasso Hertel, Muhlheim am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 3, 1976, Ser. No. 711,164
Claims priority, application Germany, Aug. 5, 1975, 2534870
Int. Cl.[2] C09B *27/00*
U.S. Cl. 8—44 1 Claim

1. A process for the preparation of a water-insoluble azo dyestuff on cellulose fiber according to the ice-color technique, which comprises using for the developing of the dyeing goods treated with the alkali metal salt of a coupling component in the neutral or slightly alkaline range, a developing bath with the diazonium compound which also contains boric acid.

4,082,504

PROCESS FOR THE CONTINUOUS DYEING OF CELLULOSE FIBERS OR MIXTURES THEREOF WITH SYNTHETIC FIBERS WITH WATER-INSOLUBLE AZO DYESTUFFS DEVELOPED ON THE FIBER

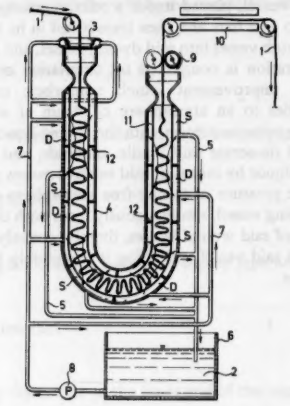
Hans-Ulrich von der Eltz, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

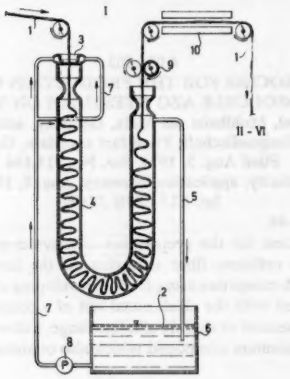
Filed Sep. 2, 1976, Ser. No. 720,070
Claims priority, application Germany, Sep. 4, 1975, 2539336
Int. Cl.[2] C09B *27/00;* D06B *1/00*
U.S. Cl. 8—44 14 Claims

1. A process for the continuous dyeing of fibers or filaments of natural or regenerated cellulose, or of a material comprising fibers or filaments of natural or regenerated cellulose, in rope form, which comprises:

applying to the rope, by means of at least two dyeing liquors, the components for producing a water-insoluble developing azo dyestuff on the fibers or filaments, the first dyeing liquor applied to the rope being an alkaline liquor containing a dyestuff coupling component and bein applied to

passing the rope through a conduit having a constriction therein and a liquor application jet or jets positioned at or





before the constriction, such that the applied liquor has an opening effect on the rope.

4,082,505

DYEING PREPARATIONS, WHICH ARE SOLUBLE IN COLD WATER, OF ANIONIC DYESTUFFS

Konrad Nonn; Karlheinz Wolf, both of Leverkusen, and Reinold Hörnle, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 10, 1975, Ser. No. 621,555

Claims priority, application Germany, Oct. 18, 1974, 2449580

Int. Cl.² C09B *67/08;* D06D *1/645*

U.S. Cl. 8—85 R **4 Claims**

1. Dry, particulate solid dyestuff preparation which is soluble in cold water and consists essentially of 10 to 70% by weight of the guanidinium salt of an anionic dyestuff or mixture of anionic dyestuffs having a particle size of not more than 10 microns and 10 to 90% by weight of a surface-active agent or mixture of surface-active agents.

4,082,506

PRINTING FORMULATIONS

Harvey Steven Koenig, Charleston, and Russell Harold Raines, Nitro, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 15, 1975, Ser. No. 622,614

Int. Cl.² C09B *67/00;* D06D *1/46*

U.S. Cl. 8—91 **3 Claims**

1. A print paste composition consisting essentially of

(A) from 0.05 to 15 weight percent of a hydroxyalkyl cellulose,

(B) from 0.1 to 5 weight percent of an ethylene oxide adduct of a mixture of C_{11} to C_{15} linear secondary alcohols, said adduct having from 2 to 15 ethyleneoxy units in the molecule,

(C) a dyestuff, and

(D) water as the balance

4,082,507

PROSTHESIS AND METHOD FOR MAKING THE SAME

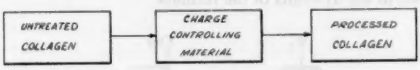
Philip N. Sawyer, 7600 Ridge Blvd., Brooklyn, N.Y. 11209

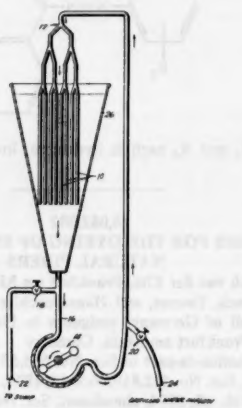
Filed May 10, 1976, Ser. No. 684,664

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.² A61F *1/24*

U.S. Cl. 8—94.11 **22 Claims**





1. A method for controlling thrombogenicity of a graft prosthesis comprising making a prosthesis selected from the group consisting of (a) collagen and (b) collagen prepared from ficin digested chemically modified artery or vein material and controlling the surface charge of the intimal surfaces of said prosthesis by reaction with a solution of a compound selected from the group consisting of bovine or human albumin, succinic anhydride, glyoxals, formic acid, ethoxyformic anhydride and 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide.

4,082,508

TREATMENT OF TEXTILE MATERIALS

Clifford Marshall, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 831,769, Jun. 9, 1969, abandoned. This application Feb. 12, 1973, Ser. No. 331,710

Claims priority, application United Kingdom, Jun. 25, 1968, 30216/68; Apr. 16, 1969, 19457/69

Int. Cl.[2] D06B *1/08*

U.S. Cl. 8—139.1 11 Claims

1. A process for dewaxing textile material having a wax content of the fibers, the steps of which consist essentially of impregnating the textile material with a solution of a surfactant in a hydrocarbon or halogenated hydrocarbon solvent so that wax content of the fibres remains in the textile material, removing the solvent from the textile and leaving the surfactant evenly distributed throughout the textile material and then washing the surfactant-containing textile material in an aqueous medium.

4,082,509

METHOD OF STORING BLOOD AND A BLOOD STORAGE BAG THEREFOR

Thomas D. Talcott, Santa Barbara, Calif., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 5, 1976, Ser. No. 712,106

Int. Cl.[2] A61L *13/00;* A61M *1/02, 1/03, 5/14*

U.S. Cl. 21—58 3 Claims

1. A method of storing blood which comprises
compounding a curable silicone rubber with $Ca(OH)_2$ which is to preserve and extend the storage life of whole blood;
inserting the compounded silicone rubber into a blood storage bag;
subsequently infusing the bag with whole blood,
whereupon there is obtained a storage stable blood.

4,082,510

AUTOCLAVE

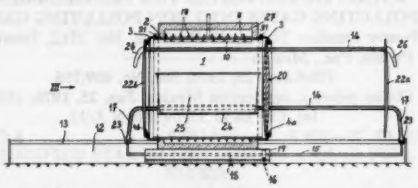
Dragomir Jovanović, 6, Impasse Jean-Moulin, Pont-de-Claix, France

Filed Jul. 20, 1977, Ser. No. 817,422

Claims priority, application France, Jul. 21, 1976, 76 23096

Int. Cl.[2] A61L *3/00;* A23L *3/00*

U.S. Cl. 21—96 10 Claims



1. An autoclave comprising:
a vessel forming a treatment chamber with two open ends, said vessel having a peripheral wall terminating at said ends in a pair of inwardly projecting annular shoulders lying in parallel planes;
a carriage displaceable perpendicularly to said planes, said carriage extending partly into said chamber and forming a support for goods to be treated therein;
a first lid parallel to said shoulders fixedly mounted on said carriage within said chamber for closing one of said ends by abutting an inner seat on the corresponding shoulder in one extreme carriage position;
a second lid parallel to said shoulders fixedly mounted on said carriage outside said chamber for closing the other of said ends by abutting an outer seat on the shoulder thereof upon said first lid abutting the opposite shoulder in said one extreme carriage position, thereby sealing said chamber, said support being located between said lids; and
control means for generating steam pressure in the chamber thus sealed, said inner seat surrounding an area larger than that surrounded by said outer seat whereby said steam pressure acts differentially upon said lids to intensify their contact with the engaged seats and prevent a shifting of said carriage during treatment of the goods in said chamber.

4,082,511

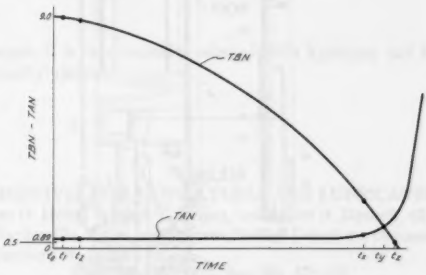
METHOD FOR PROTECTING AN INTERNAL COMBUSTION ENGINE BY DETERMINING THE CHANGE POINT OF THE LUBRICATION OIL

John E. Bedford, Houston, Tex., assignor to Pricon, Inc., Tex.

Filed Sep. 10, 1976, Ser. No. 722,084

Int. Cl.[2] G01N *33/30*

U.S. Cl. 23—230 HC 17 Claims



1. An on-site method for protecting an internal combustion engine by precisely determining the change point for the lubricating oil of the engine in the field for maximum utilization of the oil and for preventing damage to the engine, comprising the steps of:
measuring a predetermined amount of lubrication oil withdrawn from an internal combustion engine at the site in the field;
diluting the predetermined amount of lubrication oil with a predetermined amount of titration solvent;
titrating the predetermined amount of diluted lubrication oil at the site in the field with an amount of a first premixed titrating solution sufficient to reduce the pH level of the lubrication oil to a first predetermined value;
determining the Total Base Number at the site in the field from the measured amount of the first titrating solution; and
changing the lubricating oil when the Total Base Number declines to a value of from about 1.0 to 0.5.

4,082,512

MIXING HEAD FOR A REACTION INJECTION MOLDING MACHINE

Robert Dean Wingard, and Shirley Margaret Leidal, both of Akron, Ohio, assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 22, 1976, Ser. No. 753,465

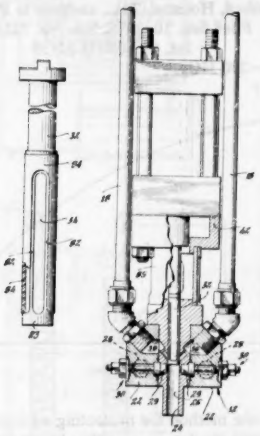
Int. Cl.[2] B28B *1/50;* B29D *27/00*

U.S. Cl. 23—252 R 7 Claims

1. In a mixing head for a reaction injection molding machine, which includes a metal block defining a bore constituting a mixing chamber, a plurality of nozzle orifices in said block opening radially into the mixing chamber, and a metal plunger received in said bore and having a plunger surface that complements said bore, at least a portion of which makes a piston fit therewith, actuating means connected to one end of said plunger for reciprocating it between a retracted position wherein the free end of the plunger is withdrawn past said

orifices to permit reactive liquid polymeric components simultaneously to enter the mixing chamber, and an extended position wherein the plunger blocks said orifices while the free end of the plunger ejects mixed components from said mixing chamber, said plunger having axially oriented by-pass channels in its surface, one each cooperating respectively with a respective nozzle orifice; the improvement comprising:

the surface of said metal plunger being formed with a first recess portion completely encompassing said plunger intermediate its ends and each of a plurality of remaining portions of said recess, equal in number to the number of by-pass channels, extending axially from said first portion and lying between adjacent by-pass channels, said recess



thereby defining a narrow land peripherally surrounding each by-pass channel and a land completely encircling the free end of said plunger; and

an antifriction, cured, polymeric-base, inorganic particulate-reinforced material disposed in the recess of the plunger surface and constituting a sleeve forming the major bearing surface of the plunger in contact with the wall of the bore, said polymeric-base material sleeve defining a plunger diameter slightly larger than the diameter of said bore prior to insertion therein but being compressed by insertion into said bore to form a close sliding seal with the wall thereof, said sleeve further being restrained against pressure-induced flow into said by-pass channels and axially of the free end of the plunger by said metal lands.

4,082,513

INTERMITTENT CATALYST ADDITION SYSTEM

Nicholaki A. Andon, Westland, and Robert I. Fleece, Detroit, both of Mich., assignors to Marathon Oil Company, Findlay, Ohio

Division of Ser. No. 543,719, Jan. 14, 1975, Pat. No. 4,018,671. This application Aug. 23, 1976, Ser. No. 716,746

Int. Cl.[2] B01J *8/18;* **C10G** *9/32*

U.S. Cl. 23—288 E **1 Claim**

1. Apparatus for the addition of catalyst to a fluid catalytic converter comprising in combination:

(a) a catalyst storage tank capable of operating at pressure greater than atmospheric having a valvable vent means, that permits operation of the storage tank at atmospheric pressure;

(b) an addition hopper located at a substantially lower elevation than said catalyst storage tank,

(c) a catalyst carrier air line having air or other gases moving through said line to said catalytic converter;

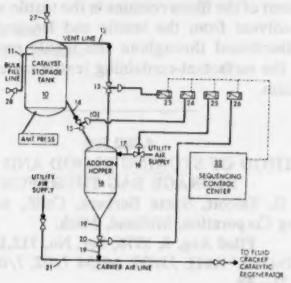
(d) a first valvable communication means between a lower portion of said storage tank and said addition hopper;

(e) a second valvable communication means between said addition hopper and said carrier air line;

(f) venting means for venting said addition hopper to said catalyst storage tank;

(g) pressurizing means for increasing the pressure of said addition hopper; and

(h) sequencing control means to which said first and second valvable communication means, said venting means and said pressurizing means are all responsive, whereby said addition hopper is vented to the pressure within said storage tank, said first valvable communication means between said storage tank and said addition hopper is opened, said second valvable communication means be-



tween said carrier air line and said addition hopper being closed so that said addition hopper is filled to a preset level and thereafter said first valvable communication means between said storage tank and said addition hopper and said venting means are closed, said pressurizing means is activated to increase the pressure in said addition hopper to a pressure at least as high as the pressure in said carrier air line and thereafter said second valvable communication means between said addition hopper and said carrier air line is opened to permit flow of catalyst from said addition hopper via said carrier air line to said fluid catalytic converter and to place the apparatus in restored condition by deactivating said pressurizing means and closing said second valvable communication means.

4,082,514

CATALYTIC CONVERTER FOR TRANSFORMING POLLUTING GASES INTO NON-POLLUTING GASES

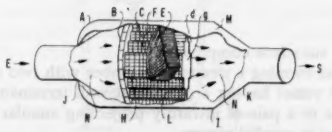
Silvestre Sanchez Torres, 30 Poniente, No. 1512, Interior 2, Puebla, Pue., Mexico

Filed Jun. 25, 1976, Ser. No. 699,755

Claims priority, application Mexico, Jun. 25, 1975, 159235

Int. Cl.[2] B01J *35/04;* **F01N** *3/15*

U.S. Cl. 23—288 F **5 Claims**



1. A catalytic converter for transforming polluting gases into non-polluting gases comprising:

(a) a housing having an inlet for the polluting gases and an outlet for the non-polluting gases;

(b) a silver coated grill within said housing adjacent to the housing inlet;

(c) a mesh, intermediate said silver coated grill and the housing outlet, said mesh comprising an alloy base consisting essentially of:

from 1.0% to 1.9% silicon,

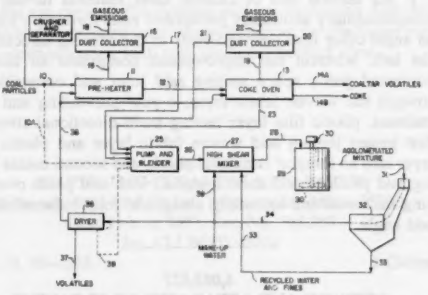
from 10% to 29% chrome,

from 1% to 5.1% copper,
from 1.1% to 9.1% molybdenum,
from 0.11% to 0.5% titanium,
from 0.1% to 1.9% carbon and from 0.5% to 0.9% iron and a coating of silver or palladium on said alloy.

4,082,515
COKE OVEN SYSTEM AND AGGLOMERATING CARRYOVER FINES THEREIN

C. Edward Capes; Allen E. McIlhinney, both of Ottawa, Canada, and Leonard Messer, Pittsburgh, Pa., assignors to American Minechem Corporation, Coraopolis, Pa.

Filed Jan. 12, 1977, Ser. No. 758,651
Int. Cl.² B01J *1/00*; C08L *95/00*; C09C *1/58*; C10B *53/04*
U.S. Cl. 23—313 R **24 Claims**



15. A method of agglomerating coke oven carryover fines comprising the steps of:

A. collecting carryover fines and liberated coal tar from the coke oven of a coke oven system; and

B. agitating said carryover fines and liberated coal tar of the coke oven with water to form an aqueous mixture and to agglomerate the carryover fines and liberated coal tar in the aqueous mixture to form agglomerates.

4,082,516
MODIFIED STARCH CONTAINING LIQUID FUEL SLURRY

Grant W. Metzger, San Andreas, Calif., assignor to Carbonoyl Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 594,393, Jul. 9, 1975, which is a continuation-in-part of Ser. No. 446,302, Feb. 27, 1974, Pat. No. 3,907,134. This application Nov. 26, 1976, Ser. No. 745,160
Int. Cl.² C10L *1/32*
U.S. Cl. 44—51 **10 Claims**

1. A substantially water free, high solids content, stable and combustible fuel slurry comprising a mixture of a solid particulate carbonaceous material in from about 5 to 50 weight percent and a liquid hydrocarbon fuel having a viscosity in the range of about 50 to 300 SSU at 175° F in from about 95 to 50 weight percent, up to 5 weight percent of water based on said mixture, from about 0.05 to 0.5 weight percent based on said mixture of an anionic surfactant, and from about 0.003 to about 0.025 weight percent of said mixture of an anionic polymer grafted starch, wherein the weight ratio of the polymer to said starch is in the range of about 0.3 to 3.

4,082,517
FUEL COMPOSITION FOR REDUCING EXHAUST GAS CATALYST PLUGGING

Leonard M. Niebylski, Birmingham, and Ellis B. Rifkin, Southfield, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 15, 1975, Ser. No. 640,682
Int. Cl.² C10L *1/22*
U.S. Cl. 44—68 **25 Claims**

1. As a composition of matter, a gasoline for an internal combustion engine comprising

(i) an antiknock amount of a cyclopentadienyl manganese tricarbonyl antiknock, and

(ii) an amount effective to reduce the plugging of an exhaust gas catalyst of a compound having the general formula:

wherein R is independently selected from hydrogen and hydrocarbyl radicals.

4,082,518
ADDITIVES FOR MOTOR FUELS AND LUBRICANTS

Hans D. Holtz; William T. Nelson, and Albert N. Devault, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 28, 1975, Ser. No. 571,901
Int. Cl.² C10L *1/22*
U.S. Cl. 44—72 **6 Claims**

1. An internal combustion fuel composition comprising a major proportion of motor fuel containing a small but effective amount, sufficient to impart detergency and reduced deposit-forming tendency to said motor fuel, of an additive which is an oil-soluble hydrogenated polymeric reaction product containing from about 0.1 to about 3 weight percent of combined nitrogen obtained upon reacting

(a) a normally liquid low molecular weight polymer of a conjugated diene with

(b) acrylonitrile to form an adduct, said diene and acrylonitrile present in an amount such that the molar ratio of conjugated diene to acrylonitrile is in the range of about 1 to 2 to about 1 to 20, and

(c) hydrogenating said adduct to remove about 55 to about 95 percent of the olefinic unsaturation and substantially all of the nitrile unsaturation.

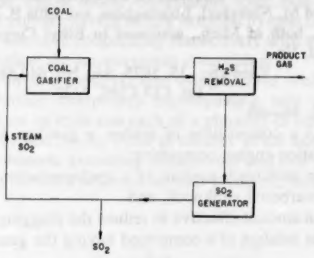
4,082,519
PROCESS FOR THE GASIFICATION OF COAL

Peter Steiner, Edison, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation of Ser. No. 395,087, Sep. 7, 1973, abandoned. This application Jun. 29, 1976, Ser. No. 700,945
Int. Cl.² C10J *3/06*
U.S. Cl. 48—202 **4 Claims**

1. In a process for the gasification of coal comprising introducing particulate coal and steam into a reaction zone wherein the steam and coal react to form an ash product and a gaseous product the improvement comprising introducing sulfur dioxide into the reaction zone in an amount of from 0.1 to 20% of the volume of said steam, maintaining the reaction zone at a temperature of from 1200° F to 1450° F, removing hydrogen sulfide from said gaseous product, converting the hydrogen sulfide to sulfur dioxide, and recycling at least a portion of said

sulfur dioxide to said reaction zone, the amount of sulfur dioxide being sufficient to promote the reaction between the coal



and steam, and the temperature being less than that required for the gasification of the coal in the absence of sulfur dioxide.

4,082,520

PROCESS OF PRODUCING GASES HAVING A HIGH CALORIFIC VALUE

Gerhard Baron, Hofheim; Herbert Bierbach; Carl Hafke, both of Frankfurt am Main, and Gunter Pockrandt, Bad Homburg, all of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Germany

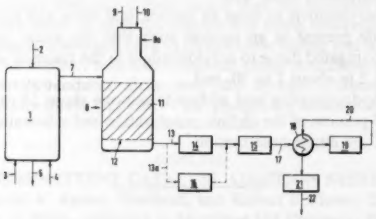
Filed Jul. 12, 1976, Ser. No. 704,709

Claims priority, application Germany, Jul. 18, 1975, 2532198

The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.

Int. Cl.[2] C10J *3/16*

U.S. Cl. 48—202 **13 Claims**



1. A process for the production of a gas having a high calorific value and containing more than about 50% methane by volume comprising supplying to a first reaction zone maintained under a pressure of about 5–150 bars counterflowing masses of coal and of oxygen and water vapor to produce a water vapor-containing raw gas having a temperature of about 350°–700° C, without cooling feeding said raw gas and oxygen into a second reaction zone maintained under a pressure of about 5–150 bars, said second reaction zone containing a bed of granular material of a particle size of about 3 to 80 mm and selected from the group composed of inert material and catalytic material, withdrawing from said second reaction zone an intermediate product gas having a temperature between about 600° C and 950° C, cooling said intermediate product gas, freeing it from sulfur compounds and subjecting it to methanation.

4,082,521

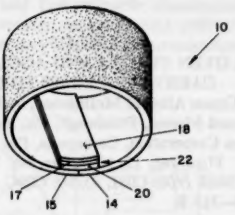
ENDLESS ABRASIVE BELT, AND LAMINATED PATCH SPLICE THEREFOR

Jarvis M. McGarvey, Grand Island, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 413,466, Nov. 7, 1973, abandoned. This application Aug. 13, 1976, Ser. No. 714,071

Int. Cl.[2] B24B *1/00*

U.S. Cl. 51—295 **20 Claims**



1. An endless belt of flexible sheet material having two complementary abuttingly juxtaposed ends forming a joint at an angle other than perpendicular to the running direction of the belt, wherein the improvement comprises: an integral laminated patch splice uniting said joint and comprising a straight slit woven fabric layer; a yaw preventing and heat resistant, plastic film layer having multi-directional strength; first means joining said woven fabric layer and plastic film layer into an integral laminated patch, and second means joining said patch to said sheet material, with said patch overlapping said ends and extending along said joint substantially at said angle.

4,082,522

METHOD AND APPARATUS OF CLEANING DUST-CONTAINING GASES

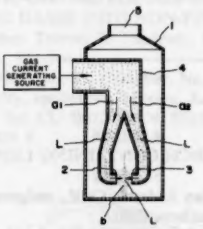
Tetsuaki Koga, Tokyo, Japan, assignor to Kokudo Doro Company Ltd., Tokyo, Japan

Filed Jul. 30, 1975, Ser. No. 600,516

Claims priority, application Japan, Jun. 9, 1975, 50-69927

Int. Cl.[2] B01D *47/02*

U.S. Cl. 55—95 **9 Claims**



1. A method of cleaning a gas containing dust, comprising the steps of:

directing gas in a dust collector structure into two gas currents, with at least one of said gas currents containing dust;

directing said two currents through a washing liquid;

colliding said two currents against each other by directing said currents towards each other in a directly opposing manner through two directly opposing spaced apart jetting ports;

forming a liquid film between said opposing jetting ports by the jetting gas pressure of said two colliding gas currents; and

cleaning said dust from said gas currents by pressing said at

least one gas current containing dust against said liquid film formed between said opposing jetting ports.

5. An apparatus for cleaning a gas containing dust, comprising:

a dust collector structure provided with a gas feeding inlet device;

at least one gas current generating source connected to said gas feeding inlet device;

said gas feeding inlet device being provided with channels for directing gas supplied by said generating source into two currents, with at least one of said gas currents containing dust;

said structure having a washing liquid disposed therein;

said inlet device having two directly opposing spaced apart jetting ports provided in each of said channels, said jetting ports being disposed in said washing liquid so as to provide a gas-liquid contact zone;

each of said gas currents being directed through said washing liquid and jetted out through a corresponding one of said opposing jetting ports so that said currents will collide with each other in a directly opposing manner;

a liquid film formed between said jetting ports by said colliding gas currents for cleaning said gas containing dust; and

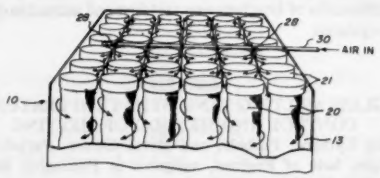
said structure being provided with a clean gas discharge port communicating with said gas-liquid contact zone.

4,082,523

FILTER BAG CLEANING APPARATUS

Josef Pausch, 2016 Dwight La., Minnetonka, Minn. 55343

Filed Feb. 4, 1977, Ser. No. 765,783
Int. Cl.² B01D *46/04*
U.S. Cl. 55—293 **7 Claims**



1. In a filtration apparatus including a filter bag housing having a plurality of filter bags therein and an inlet chamber in communication with all of the bag interiors, and a dirt collection chamber in communication with the opposite end of the bag interiors, and a bag chamber in communication with an outlet and enclosing the bag exteriors, said apparatus comprising:

a. an upper isolating wall between said inlet chamber and said bag chamber, said wall having a plurality of openings therethrough, each opening in alignment with a bag interior and having a supporting surface projecting into said bag interior;

b. a lower isolating wall between said collection chamber and said bag chamber, said wall having a plurality of openings therethrough, each opening in sealable alignment with a bag interior;

c. a collar surrounding each bag exterior adjacent one of said openings in the upper isolating wall, said collar having an axial length dimension of at least four inches; and

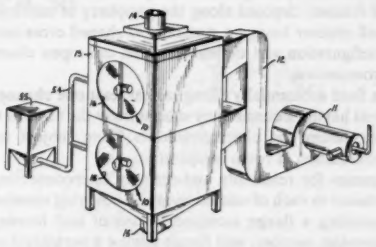
d. a high pressure air pipe in said bag chamber and positioned proximate said upper isolating wall, said high pressure air pipe having therethrough a plurality of air jets, each air jet positioned intermediate adjacent collars and directed toward said collars to directionally couple high pressure air against said collars.

4,082,524

SELF-CLEANING FILTER

Richard D. Noland, 2208 W. 56th, Mission Hills, Kans. 66208

Filed Mar. 21, 1977, Ser. No. 779,354
Int. Cl.² B01D *46/12*
U.S. Cl. 55—294 **2 Claims**



1. A self-cleaning filter for removing particulate matter from a gas stream flowing through the discharge of a chamber housing, said filter comprising:

a circular filter mounted over the discharge of said chamber housing;

a circular track circumscribing said filter;

a drive train mounted centrally of said filter and including a rotatable drive shaft with a flexible couple positioned substantially perpendicular to said filter;

an elongate rotor having first and second ends and being centrally coupled by said flexible couple to said drive shaft to transverse said filter, said rotor including a rollable wheel mounted on said first end to engage said circular track and a reciprocally spring biased wheel mounted on said second end to engage said circular track and thereby urge to engagement said rollable wheel on said first end with said circular track, said rotor further including vacuum means associated with said first end to vacuumingly remove particulate matter from said filter; and

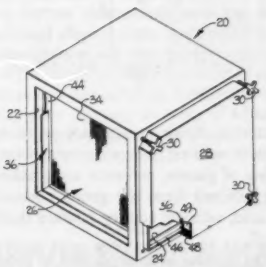
power means connected to said drive train to angularly rotate said rotor over said filter whereby said vacuum means continuously cleans said filter.

4,082,525

REMOVABLE FLUID SEALING MEMBER

Thomas T. Allan, San Francisco, Calif., assignor to Flanders Filters, Inc., Washington, N.C.

Filed May 13, 1976, Ser. No. 685,978
Int. Cl.² B01D *46/10*; F16J *15/14*
U.S. Cl. 55—355 **12 Claims**



1. A housing assembly adapted to form a part of an enclosed air flow system and utilizing a fluid sealing material therein, and characterized by the ability to remove the fluid sealing material from the system in the event of the contamination thereof, and comprising

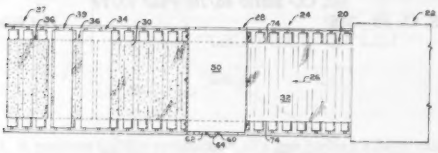
a housing having an opening therein,
a covering member disposed across said opening,
means for releasably sealing the periphery of said covering member for the periphery of said opening to preclude the passage of air therebetween while permitting the covering member to be withdrawn and removed from its position across said opening, said sealing means comprising
(a) a retainer disposed along the periphery of said opening, said retainer having a generally U-shaped cross-sectional configuration and defining at least one open channel in cross-section,
(b) a fluid substantially filling said at least one channel, said fluid having a consistency substantially the same as that of petrolatum and characterized as being subject to easy deformation at room temperature, and
(c) means for releasably and sealably interconnecting said retainer to each of said housing and covering member, and including a flange mounted to one of said housing and covering member, said flange having a peripheral outline corresponding to that of said at least one retainer channel and extending into said at least one channel and fluid to effect a seal therebetween, and a receptacle fixedly and sealably mounted to the other of said housing and covering member, said receptacle having a generally U-shaped cross-sectional configuration defining an open side, and closely receiving said retainer therein to form a seal between the receptacle and retainer, and such that the retainer may be separated from the receptacle by withdrawing the retainer through the open side of the receptacle,
whereby the retainer and fluid carried therein may be separated from the housing and covering member by withdrawing the covering member from the opening and removing the retainer.

4,082,526

METHOD OF APPLYING POWDER TO A GLASS RIBBON

Ronald L. Estes; Larry S. McGee, both of Carlisle, and Sanford M. Welton, Mount Holly Springs, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1976, Ser. No. 728,367
Int. Cl.² C03B 33/00
U.S. Cl. 65—24 **9 Claims**



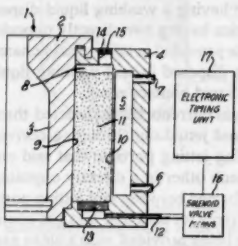
1. A method of applying a temporary protective layer of a powder to a sheet of a refractory material selected from the group consisting of glasses, ceramics and glass-ceramics, said powder being selected from the group consisting of adipic acid, benzoic acid, salicylic acid or mixture thereof, comprising the steps of:
vaporizing the powder in an applicator to produce an atmosphere comprising vaporized powder or a mixture of vaporized powder and powder; and
exposing a surface of the sheet to the atmosphere in the applicator for a time sufficient to deposit a temporary protective layer of powder from the atmosphere thereupon.

4,082,527

METHOD FOR TRANSFERRING HEAT FROM A GLASS MOLD

Stanley Peter Jones, Doncaster, and William Ferguson Watson, Shrewsbury, both of England, assignors to Emhart Limited, England

Continuation of Ser. No. 597,785, Jul. 21, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,060
Claims priority, application United Kingdom, Jul. 22, 1974, 32311/74
Int. Cl.² C03B 9/38
U.S. Cl. 65—83 **6 Claims**



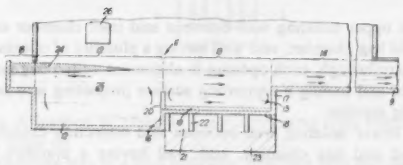
1. In a cyclic system for forming glassware in a forming mould the improvement comprising:
a. providing a fluidized bed in a cavity having a first surface defined by the mould and a second surface spaced from the first surface,
b. altering the temperature of said second surface by circulating a cooling fluid through a chamber adjacent said second surface,
c. alternately collapsing and restoring said fluidized bed by selectively supplying gas to said cavity whereby the rate of transfer of heat between said first and second surfaces is regulated.

4,082,528

GLASS MELTING TANK WITH TEMPERATURE CONTROL AND METHOD OF MELTING

Stanley Lythgoe, Parbold, and David Gelder, Parbold, near Wigan, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Continuation of Ser. No. 653,825, Jan. 30, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,394
Claims priority, application United Kingdom, Jan. 31, 1975, 4361/75
Int. Cl.² C03B 5/22
U.S. Cl. 65—135 **14 Claims**



1. In a method of refining molten glass in a refining zone of a tank containing molten glass, which method comprises supporting molten glass on a heat conducting support material forming the base of the refining zone, heating the upper regions of the molten glass so that the temperature of the upper region is sufficient to effect refining, and enforcing flow of the glass such that the upper regions of the glass flow forwardly through the refining zone from an inlet to the refining zone towards an outlet from the refining zone while a colder return

flow takes place in the lower regions of the glass in the refining zone, the improvement comprising

establishing the depth of glass in the zone in relation to the length of the zone and the temperature difference between the glass at the inlet and outlet of the zone so that the ratio of return flow to forward flow is between 1/6th and ½; and removing heat from the lower region of the molten glass in the refining zone through said support material forming the base of the refining zone to minimize undesirable interaction of the molten glass with the support material.

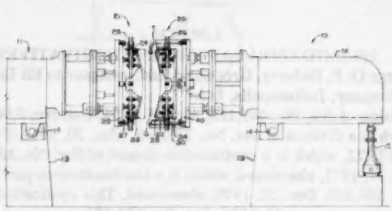
6. A glass melting tank having a melting zone at one end of the tank into which glass forming materials are fed, a conditioning zone in which molten glass is brought to a desired thermal condition prior to discharge from the tank, a refining zone with a refractory base between the melting and conditioning zones, and means for applying heat to the upper surface of the glass in the melting and refining zones, the refining zone being provided with a layer of molten metal at the base of the tank on which the molten glass is supported out of contact with said refractory base, and cooling means located below the base of the tank adjacent the refining zone for removing heat from the lower region of molten glass in the refining zone, said melting zone being arranged to hold molten glass at a greater depth than said refining zone and said conditioning zone being shallower than said refining zone and arranged so that molten glass flow through said conditioning zone is entirely in the forward direction.

4,082,529

GLASS BENDING PRESS WITH OFFSET HINGES

Joseph B. Kelly, Crestline, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1977, Ser. No. 756,210
Int. Cl.² C03B 23/02
U.S. Cl. 65—273 **3 Claims**



1. An apparatus for press bending heat-softened glass sheets to a curvature including a line of sharp bending, comprising:

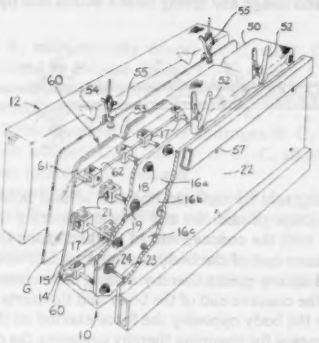
opposed male and female shaping members including opposed glass shaping surfaces of complementary curvature corresponding to the desired curvature for the glass sheets, the glass shaping surface of the male member having a protruding ridge defining a line of sharp bending flanked by areas on said male shaping surface of less severe curvature, the female shaping member including two segments, one on either side of a plane extending from said ridge on the male shaping surface and passing through the line of sharp bending in angular symmetry to said flanking areas on the male shaping surface, the two female segments being hinged together to rotate about an axis lying within said plane and obliquely intersecting the line of sharp bending, means to convey a heat-softened glass sheet into and out of a shaping station between said shaping surfaces and means to move the shaping members into and out of pressing engagement with a glass sheet in said shaping position so as to bend the glass sheet to the desired curvature.

4,082,530

PRESS BENDING APPARATUS AND METHOD OF FABRICATION

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 12, 1977, Ser. No. 758,875
Int. Cl.² C03B 23/02
U.S. Cl. 65—273 **6 Claims**



1. Apparatus for shaping a heat-softened glass sheet comprising a relatively flexible shaping plate having a glass engaging surface correlated with the shape desired for said glass sheet, a relatively rigid adjusting plate, adjustable connecting means interconnecting spaced portions of said shaping plate to corresponding spaced portions of said adjusting plate in spaced relation therebetween and adjustable to change the shape of said shaping plate, characterized by edge reinforcing means attached to the reverse surface of said shaping plate opposite said glass engaging surface along substantially the entire length of an edge portion thereof, said reinforcing means extending longitudinally in a direction substantially aligned with said edge portion of said shaping plate.

5. A method of fabricating a press bending mold for shaping a glass sheet comprising a relatively flexible shaping plate having a glass receiving surface correlated with the shape desired for said glass sheet, a relatively rigid connecting plate and adjustable connecting means interconnecting spaced portions of said shaping plate and corresponding portions of said connecting plate, said method comprising impartng approximately the shape desired to said shaping plate, attaching edge reinforcing plate means to the back surface of said shaping plate along an edge portion thereof, cutting a tong-receiving notch through said shaping plate at an edge portion thereof which is reinforced with said edge reinforcing plate means so as to simultaneously cut through a portion of said edge reinforcing means thereby substantially avoiding distorting adjacent portions of said shaping plate, said reinforcing plate means extending inwardly from said edge portion a sufficient distance so that the notch extends into only a portion of said reinforcing plate means attaching said notched, reinforced shaping plate to said connecting plate through an array of adjustable connectors, and adjusting a selected one of said connectors to modify the shape of said shaping plate in portions thereof where adjustment is desired.

4,082,531

HOLDER FOR ROTATING GLASS BODY

Floyd W. Kolleck, Clarendon Hills, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

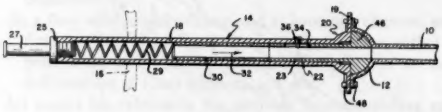
Filed Jan. 24, 1977, Ser. No. 762,226
Int. Cl.² C03B 23/04, 9/40
U.S. Cl. 65—296 **6 Claims**

1. A device for holding a glass body wherein the glass body

has a symmetric concave end of particular configuration, comprising:

a tubular tip holder having a flange at one end thereof, a centering tip positioned in said one end of said tip holder capable of sliding into and out of said one end of said tubular holder, said tip having an end projecting from said holder of specific shape,

means capable of clamping the concave end of the body against said flange and spring means within said tip holder



for biasing said tip out said one end of said holder, said specific shape of said one end of said centering tip being matable with the concave end of the body such that with the concave end of the body clamped against said flange and said spring means thereby biasing said centering tip against the concave end of the body said tip exerts an axial force on the body opposing the force exerted on the body by said means for clamping thereby centering the concave end on the device.

4,082,532

PROCESS FOR MAKING EXTRUDED CATTLE MANURE PELLETS

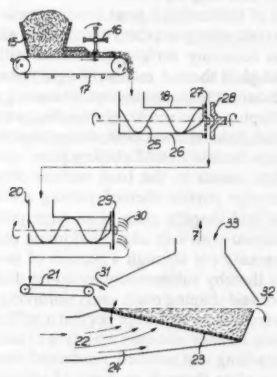
Hugo Imhof, Geneva, Switzerland, assignor to S.A.F. Societe Agricole et Fonciere S.A., Luxembourg

Continuation of Ser. No. 577,167, May 14, 1975, abandoned. This application Apr. 19, 1977, Ser. No. 788,812

Claims priority, application Switzerland, Jul. 3, 1974, 9140/74; Nov. 13, 1974, 15121/74

Int. Cl.[2] C05F *11/08, 3/00*

U.S. Cl. 71—8 **17 Claims**



1. A process for pelletizing cattle manure into pellets suitable for use as soil fertilizer comprising:

providing a substantially homogeneous coherent pulp of said cattle manure with a moisture content of from 45 to 60% by weight;

chopping said pulp until it is sufficiently fine to be extruded;

horizontally extending by extrusion said pulp immediately after chopping to form unsupported elongated frangible strands sufficiently long to break off under their own weight thereby causing said strands to break into elongated sections;

providing means defining a receiving surface beneath the falling strand sections so that the falling strand sections strike the receiving surface and further break into smaller sections upon impact; and

mechanically vibrating said smaller strand sections in a fluidizied bed, maintained by supplying a raising stream of hot gas, to further break said smaller strand sections into pellets and at least superficially dry the pellets.

7. A process according to claim 1, further comprising decanting and collecting liquids from liquid manure, spraying said liquids onto dried organic waste material, and allowing the resulting mixture to ferment until the moisture content is within the specified range.

4,082,533

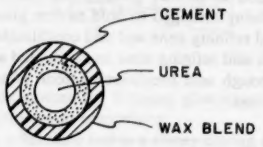
COATED CONTROLLED-RELEASE PRODUCT

Lawrence S. Wittenbrook, Marysville, and Edwin L. Scheiderer, Columbus, both of Ohio, assignors to D. M. Scott & Sons Company, Marysville, Ohio

Filed Jun. 27, 1973, Ser. No. 373,972

Int. Cl.[2] C05C *9/00*

U.S. Cl. 71—28 **21 Claims**



1. A coated product providing for the release of a water soluble fertilizer over a long period of time comprising a core containing a water soluble fertilizer in particulate form and two water insoluble coatings surrounding said core, the inner of said two coatings comprising cement.

8. The product of claim 1 in which the fertilizer is urea.

4,082,534

1H-IMIDAZO(4,5-b)PYRIDINE DERIVATIVES

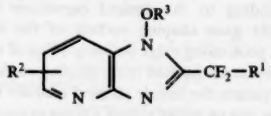
George O. P. Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 447,115, Mar. 1, 1974, Pat. No. 3,961,937, which is a division of Ser. No. 236,195, Mar. 20, 1972, Pat. No. 3,818,022, which is a continuation-in-part of Ser. No. 181,638, Sep. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 100,410, Dec. 21, 1970, abandoned. This application Mar. 29, 1976, Ser. No. 671,657

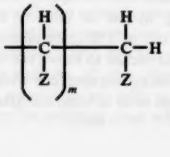
Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—92 **15 Claims**

1. method which comprises applying to a plant part a growth-inhibiting amount of an active agent, said active agent being a compound of the formula:



wherein R^1 represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of C_1–C_6, or radical of the formula:

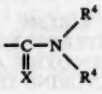


wherein each Z independently represents hydrogen or halogen and m represents 0 or 1; R^2 represents halogen, nitro, $-CF_3$, $-CF_2Cl$, $-CF_2H$, or loweralkylsulfonyl of C_1–C_4; and R^3 represents

(1) alkanoyl of C_2–C_{16};

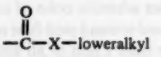
(2) alkenoyl of C_3–C_{16};

(3) carbamoyl of the formula

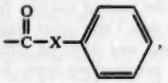


wherein X represents oxygen or sulfur; and one R^4 represents phenyl, loweralkyl of C_1–C_4, or loweralkenyl of C_2–C_4, and the other R^4 represents hydrogen, loweralkyl of C_1–C_4, or loweralkenyl of C_2–C_4, subject to the limitation that both R^4 moieties taken together do not contain more than six carbon atoms, or both R^4 moieties taken together represent straight-chain alkylene of C_2–C_6, both inclusive;

(4) radical of the formulae

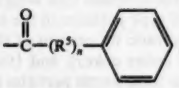


of C_1–C_4 or



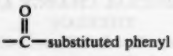
wherein X is, as above, oxygen or sulfur;

(5) radical of the formula

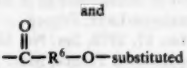


wherein R^5 represents methylene, ethylene, or vinylene, and n represents 0 or 1;

(6) radical of the formulae



and



phenyl, wherein substituted phenyl is a phenyl radical bearing from 1–3 substituents, each of which is independently amino, nitro, chloro, methyl, or methoxy, and R^6 represents loweralkylene of C_1–C_4, both inclusive; or

(7) $-SO_2-R_7$ wherein R^7 is loweralkyl as above defined, cycloalkyl of C_3–C_6, phenyl, substituted phenyl as above defined, or benzyl.

4,082,535

PYRIMIDINE DERIVATIVES

Karl Hoegerle, Basel, and Dagmar Berrer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

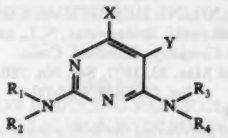
Filed Jun. 30, 1976, Ser. No. 701,322

Claims priority, application Switzerland, Jul. 7, 1975, 8836/75

Int. Cl.² A01N 9/22; C07D 239/48

U.S. Cl. 71—92 **10 Claims**

1. A pyrimidine derivative of the formula



in which

R_1 and R_3 independently denote C_1–C_4 alkyl; C_1–C_4 alkyl substituted by halogen, cyano, C_1–C_4 alkoxy, C_1–C_4 alkylthio, cyclopropyl or phenyl; C_2–C_4 alkenyl; C_2–C_4 alkynyl; or cyclopropyl,

R_2 and R_4 independently denote hydrogen or C_1–C_4 alkyl,

X denotes halogen; C_1–C_4 alkoxy; or C_1–C_4 alkylthio, and

Y denotes hydrogen or halogen,

with the proviso that at least one of R_1 and R_3 is cyclopropyl or cyclopropylalkyl, and an addition salt of said pyrimidine derivative with an inorganic or organic acid.

6. A herbicidal composition which comprises as active component a pyrimidine derivative according to claim 1, and a carrier.

4,082,536

HETEROCYCLIC COMPOUNDS AND THEIR USE AS PESTICIDES

Ian Trevor Kay, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

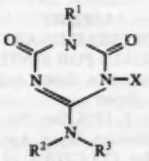
Division of Ser. No. 515,090, Oct. 15, 1974. This application Oct. 23, 1975, Ser. No. 625,138

Claims priority, application United Kingdom, Nov. 1, 1973, 50827/73; Feb. 15, 1974, 6959/74

Int. Cl.² A01N 9/22

U.S. Cl. 71—93 **5 Claims**

1. A process of inhibiting the growth of unwanted plants, which comprises applying to plants, or to a plant growth medium, a phytotoxic amount of a triazine-dione compound of the formula:



wherein R^1 is an alkyl radical of 1 to 8 carbon atoms and either (a) R^2 is a carboxylic acyl radical of formula $R^4.CO-$ wherein R^4 is a carboxy group, an alkoxycarbonyl group, an alkoxy group of 1 to 6 carbon atoms, an alkyl group of 1 to 6 carbon atoms, or a phenyl radical and R^3 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms, or (b) R^2 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms and R^3 together with the group X, forms a divalent radical Z linking the exocyclic nitrogen atom to which R^3 is attached to the nitrogen atom in the triazine ring, so as to form a second 5- or 6-membered ring, the radical Z being selected from the group consisting of oxalyl (—CO.CO—), 1,2-dihydroxyethylene (—CH(OH)—CH(OH)—), and radicals of the formula $-CH_2NR^5CH_2-$ wherein R^5 is phenyl, an alkyl group of 1 to 10 carbon atoms or hydrogen; and X is a hydrogen atom, a salt-forming cation comprising an alkali metal, an alkaline earth metal, ammonia, or a primary, secondary, or tertiary alkyl amine in which the alkyl contains 1 to 6 carbon atoms, or an alkyl radical of 1 to 6 carbon atoms, or together with R^3 forms the divalent group Z.

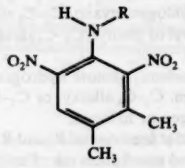
4,082,537

2,6-DINITROANILINE HERBICIDAL COMPOSITIONS

Joseph John Dudkowski, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 23, 1977, Ser. No. 780,377
Int. Cl.[2] A01N *17/00*
U.S. Cl. 71—121 7 Claims

6. A method of preventing the formation of crystals in wettable powder formulations of about 98% to 99% by weight of a compound of the formula:



wherein R is 1-ethylbutyl, 1-ethylpropyl, 1-methylpropyl or 1-methylbutyl which comprises

melting the compound at about its melting point,

adding a surfactant of 1% to about 2% by weight of a sodium dialkyl C_6–C_8 sulfosuccinate,

stirring the mixture until a homogeneous solution results, and then

cooling the melt until it resolidifies.

4,082,538

SELECTIVE WEED CONTROL WITH M-DINITROBENZENE

Dougal Harold McRae, Hatboro, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 67,199, Aug. 26, 1970, abandoned. This application Jun. 8, 1973, Ser. No. 368,374
Int. Cl.[2] A01N *9/20*
U.S. Cl. 71—125 5 Claims

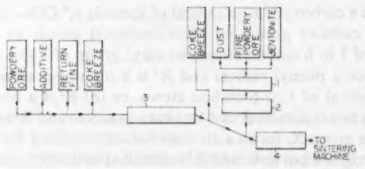
1. A method of selectively controlling monocotyledonous weeds in corn or wheat which comprises applying to the surface of the growth medium, prior to the emergence of the weeds from the growth medium, m-dinitrobenzene at a rate of 0.5 to 20 lbs. per acre.

4,082,539

METHOD FOR THE PRELIMINARY TREATMENT OF MATERIALS FOR SINTERING

Kinichi Sugawara, Kitakyushu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 1, 1976, Ser. No. 672,789
Claims priority, application Japan, Apr. 2, 1975, 50-39215
Int. Cl.[2] C22B *1/14*
U.S. Cl. 75—3 13 Claims



1. In a method for preliminarily treating sintering materials containing fine powder of a particle size of less than 125μ in the range of 15% to 35% comprising adding in a first treatment step solid carbon to a mix component consisting of powdery or fine powdery iron ore, fluxing materials, dust recovered from steel-making operations and return fines from a sintering operation and then mixing, effecting moisture adjustment, and subjecting said component to a pseudo granule formation operation, and then adding in a second treatment step solid carbon to the material resulting from said first step and thereafter effecting mixing, moisture adjustment and pseudo granule formation operations, the improvement wherein

mini-pellets at least 75% of which are of a size of 1 to 7 mm are added in the second step to said first step material in an amount of 3% to 15% by weight of the materials present other than coke, return fines and hearth layer.

4,082,540

MATERIAL FOR SINTERING EMITTING A LESSER AMOUNT OF NITROGEN OXIDE AND A METHOD FOR MANUFACTURING THE SAME

Minoru Sasaki, Yokohama; Yukihiro Hida; Tsuneo Enokido, both of Kawasaki, and Kaoru Ito, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 537,533, Dec. 30, 1974, Pat. No. 4,001,007.
This application Aug. 2, 1976, Ser. No. 710,382
Int. Cl.[2] C22B *1/08, 1/24, 1/16*
U.S. Cl. 75—3 3 Claims

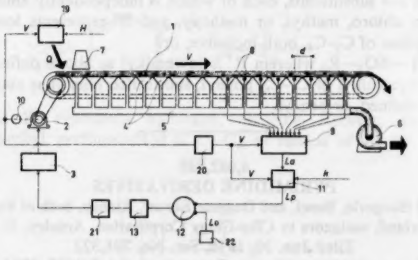
1. A pellet for preparing a sintered ore for use in iron making operations, said pellet comprising as ingredients iron ore, fines, limestone and coke in particulate form and includes S type agglomerated particles wherein coke of at least 1 mm forms a first central nucleus and around said first nucleus there are fine powders of not more than 1 mm of all said ingredients, which attach to said first central nucleus and form an outer shell layer; C type agglomerated particles wherein the said ingredients of at least 1 mm other than coke form a second central nucleus and around the second nucleus fine powders of said ingredients not more than 1 mm other than coke attach to said second central nucleus and form an intermediate layer and further around said intermediate layer fine powders of not more than 1 mm of all of said ingredients attach and form an outer shell layer, or C type agglomerated particles wherein fine powders of not more than 1 mm of all said ingredients attach to said second central nucleus and form an outer shell layer, and satisfying the formulas {the weight ratio by percent of the coke to form C type particles in the entire coke} $\geqq$ (60 + 0.5 $\times$ {the weight ratio by percent of the coke to form S type particles in the entire coke}), and {the weight ratio by percent of the coke to form S type particles in the entire coke} $\leqq$ 20.

4,082,541

INSTALLATION FOR THE AGGLOMERATION OF A PARTICULATE MINERAL CHARGE AND OPERATION THEREOF

Alain Didier, and Jean-Luc Letailleur, both of Metz, France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), St. Germain-en-Laye, France

Filed Mar. 17, 1975, Ser. No. 559,140
Claims priority, application France, Mar. 27, 1974, 74 10588
Int. Cl.[2] C22B *1/08, 1/24, 1/16*
U.S. Cl. 75—5 4 Claims



1. In a method of operating an installation for the agglomeration of a particulate mineral charge on an elongate grid moving

through a treatment path, wherein a gas is passed through the charge during the agglomeration, the temperature of the gas passed through the charge is measured along the path, and the velocity of displacement of the grid is modified to maintain the point of firing of the charge at a predetermined position of the path: the steps of

(1) substantially continuously determining the position of the point of rise in the temperature of the gas passed through an element of the charge in respect of the path,

(2) generating a control signal whose instantaneous value is representative of the position of the point of firing of the charge in respect of the path,

(a) the value of the signal being calculated in accordance with the equation

$$L_p = L_a + kV$$

wherein L_p is the instantaneous value of the control signal, L_a is the position of the point of rise in the temperature of the gas, V is the velocity of displacement of the moving grid, and k is a constant, and

(3) modifying the velocity of displacement of the grid until the value of the control signal is equal to a constant value corresponding to the predetermined position of the point of firing.

4,082,542

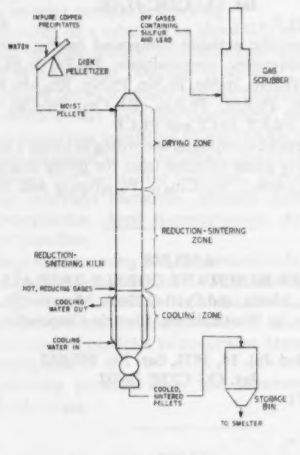
COPPER PRECIPITATE AGGLOMERIZATION PROCESS

David B. George, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 638,022, Dec. 5, 1975, abandoned. This application May 16, 1977, Ser. No. 796,972

Int. Cl.² C22B *15/14*

U.S. Cl. 75—5 **11 Claims**



1. A process for treating impure copper precipitates, containing from about 65 to over 95 percent by weight copper, from about 1 to 15 percent by weight oxygen, and from about 0.1 to 2 percent by weight sulfur, said oxygen and sulfur being chemically combined with the copper in the precipitates, to produce high-grade copper pellets suitable for being fed directly to smelting and refining furnaces, said process comprising mixing the precipitates with sufficient water to form a coherent, moldable mass of moist precipitates; forming pellets from the moist precipitates; drying the so-formed pellets; heating the dried pellets in a reducing atmosphere to a sintering temperature of at least 700° C, for a time sufficient to form dense, unfriable, high-grade, copper pellets containing at least about 75 percent by weight copper and having no more than about 1.0 percent by weight oxygen in the form of copper oxides and 1 percent by weight sulfur; and cooling the high-grade copper pellets in an inert or reducing atmosphere to a temperature below about 150° C.

4,082,543

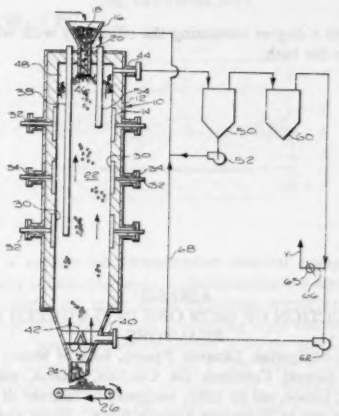
METHOD FOR REDUCING PARTICULATE IRON OXIDE TO METALLIC IRON WITH SOLID REDUCTANT

Donald Beggs, Charlotte, N.C., and Bruce G. Kelley, Fort Mill, S.C., assignors to Midrex Corporation, Charlotte, N.C.

Filed Feb. 16, 1977, Ser. No. 769,242

Int. Cl.² C21B *13/12*

U.S. Cl. 75—11 **14 Claims**



1. A method of reducing particulate iron oxide material to metallic iron with a solid reductant comprising:

continuously feeding particulate iron oxide and solid particulate carbonaceous fuel to a particle inlet at the top of a shaft furnace to establish a packed burden therein;

removing particulate product from a particle outlet at the bottom of said burden through said furnace;

passing an electric current through the burden to provide sufficient heat by direct resistance heating to react said carbonaceous fuel with oxygen from said particulate iron oxide to reduce said iron oxide substantially to metallic iron;

causing the reaction products to move through said burden in counterflow relation with it, and form a top gas;

removing top gas from the upper region of the shaft furnace; cooling said top gas; and

recirculating the cooled gas to the burden through a gas inlet at the lower region of said furnace.

4,082,544

ELECTRIC INDUCTION HEATING OF MATERIALS OF LOW ELECTRICAL CONDUCTIVITY

Bengt Fredrikson, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Feb. 19, 1976, Ser. No. 659,285

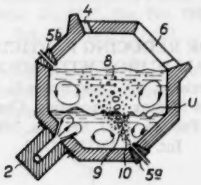
Claims priority, application Sweden, Feb. 25, 1975, 7502083

Int. Cl.² C21C *5/52*

U.S. Cl. 75—12 **7 Claims**

1. A method for heating fused electrically non-conductive material, comprising forming a metal melt in a furnace, pouring said material on the melt so as to form a bath of the material floating on and completely covering the melt's surface and so that the melt and bath form a coextensive interface, inductively heating the melt so that the melt heats the bath via said interface, and injecting a pneumatic blast into the melt upwardly

from the melt's lower portion towards said interface and with the blast having a force and direction causing said interface to



undulate to a degree increasing the efficiency with which the melt heats the bath.

4,082,545

REDUCTION OF IRON ORE IN FLUIDIZED BED REACTORS

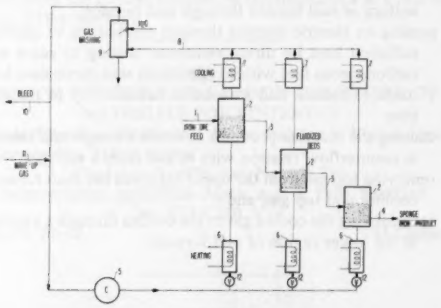
Giansilvio Malgarini; Edoardo Pasero, both of Rome; Giorgio Alitta, Genoa; Cristiano De Candida, Genoa, and Carlo Raggio, Genoa, all of Italy, assignors to Istituto di Ricerca Finsider per la Riduzione Diretta S.p.A., Rome and Italimpianti S.p.A., Genoa, both of, Italy, part interest to each

Filed Aug. 4, 1976, Ser. No. 711,458

Claims priority, application Italy, Aug. 5, 1975, 50827 A/75

Int. Cl.² C21B *13/02*

U.S. Cl. 75—35 **4 Claims**



1. A process for the direct reduction of iron ore, comprising establishing a plurality of fluidized beds each of which has a horizontal perforated plate at the bottom thereof, heating and progressively reducing iron ore by passing said iron ore in series through said plurality of fluidized beds, fluidizing said beds with reducing gas by passing said reducing gas up through the perforated plate of each bed, removing partially spent reducing gas from each said bed, cooling and washing said partially spent reducing gas to remove substantially all the solids thereform, heating said washed gas, and again feeding said heated fluidizing gas through a said bed from beneath the perforated plate thereof, all the fluidizing gas that passes between said beds being subjected to said washing between said beds.

4,082,546

RECOVERY OF WASTE HEAVY METALS FROM SOLUTIONS BY CEMENTATION WITH ALUMINUM

Richard A. Wallace, 3425 SW. Barbur Blvd., Portland, Oreg. 97201

Continuation-in-part of Ser. No. 644,243, Dec. 24, 1975, Pat. No. 4,008,077, which is a continuation-in-part of Ser. No. 407,740, Oct. 18, 1973, abandoned. This application Nov. 11, 1976, Ser. No. 741,082

The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.

Int. Cl.² C22B *11/04, 15/12, 19/20, 23/04*

U.S. Cl. 75—109 **11 Claims**

1. A method for recovering metal from spent metal ion-laden solutions wherein the metal is selected from the group consisting of zinc and Groups IB and VIII of the Periodic Table of Elements of atomic number in the range of 29 to 79 which comprises:

contacting said spent metal-laden solution with finely divided mechanically worked aluminum coated with an imperfect aluminum oxide coating, whereby finely divided metal is formed; and

recovering the finely divided metal.

4,082,547

INTERMETALLIC COMPOUNDS AND METAL PURIFICATION

Uwe Berndt, Karlsruhe; Bernhard Erdmann, Lampertheim, and Cornelius Keller, Karlsruhe, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Division of Ser. No. 265,796, Jun. 23, 1972, Pat. No. 3,994,718. This application May 30, 1974, Ser. No. 474,864

Claims priority, application Germany, Mar. 30, 1972, 2215694; Mar. 30, 1972, 2215695

Int. Cl.² C22C *43/00*

U.S. Cl. 75—122.7 **4 Claims**

1. An intermetallic actinide compound having one of the following stoichiometric compositions: Rh_3Pa, Ir_3Pa, Pt_3Pa, Pt_5Pa, Rh_3Np, Pd_3Np, Ir_2Np, Pt_3Np, Pt_5Np, Rh_2Am, Rh_3Am, Pd_3Am, Ir_2Am, Pt_2Am, Pt_5Am, Rh_3Cm, Pd_3Cm, Ir_2Cm, Pt_2Cm, Pt_5Cm, Pd_3Cf, Ir_2Cf and Pt_5Cf.

4. An intermetallic compound according to claim 1 in admixture with an alloy phase selected from the group consisting of $Pd_{0.9}AM_{0.1}$, $Ir_{0.9}Am_{0.1}$, $Ir_{0.9}Cm_{0.1}$, $Pt_{0.95}Np_{0.05}$ and mixtures thereof.

4,082,548

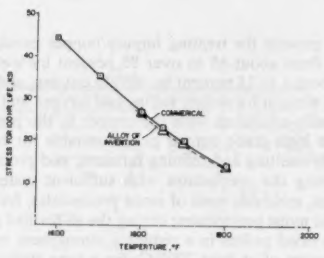
HIGHCREEP-RESISTANT COBALT-BASE ALLOY

Willi Kleemann, Media, and Cyril G. Beck, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jul. 14, 1975, Ser. No. 595,642

Int. Cl.² C22C *19/07*

U.S. Cl. 75—171 **1 Claim**



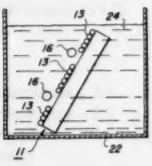
1. A creep-resistance cobalt base alloy for use in gas turbine engines consisting essentially of the following elements in weight percent:

Carbon	0.55	to	0.65
Chromium	22.5	to	24.25
Nickel	9.0	to	11.0
Titanium	0.15	to	0.50
Tungsten	6.5	to	7.5
Tantalum	3.0	to	4.0
Aluminum	0.10	to	0.2
Iron	1.5	maximum	
Boron	0.010	maximum	
Silicon	0.40	maximum	
Manganese	0.10	maximum	
Zirconium	0.050	maximum	
Cobalt	balance.	—.	

4,082,549
AGGLOMERATION IMAGING PROCESS

Werner E. L. Haas, Webster; James E. Adams, Ontario, and Bela Mechlowitz, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 27, 1972, Ser. No. 301,383
Int. Cl.² G03G *13/00*
U.S. Cl. 96—1 R **17 Claims**



1. An imaging method comprising:

(a) providing on a substrate an about 0.05 to about 5 micron thick microscopically discontinuous layer of particles having an average diameter of about 0.5 to about 5 microns and center to center particle spacings of up to about 5 microns; said particles comprising material selected from the group consisting of amorphous selenium, amorphous selenium alloys, tellurium, mixtures of amorphous selenium and crystalline selenium, arsenic, zinc, sulfur, dyed polyvinyl carbazole, gallium, cobalt tricarbonyl, thermoplastics, dyed thermoplastics, dyed waxes and dyed paraffins;

(b) imagewise exposing said discontinuous layer to radiation of about 2,000 to about 26,000 A in wavelength and at an energy of about 0.001 to about 0.3 joules/cm² for about 1 to about 10^4 microseconds wherein the total cross-sectional area of particles in imagewise exposed areas is decreased; and

(c) removing particles from said substrate in imagewise exposed areas.

4,082,550
HEXACHLOROCYCLOPENTENE CHEMICAL SENSITIZERS FOR HETEROGENEOUS ORGANIC PHOTOCONDUCTIVE COMPOSITIONS

William E. Yoerger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 25, 1977, Ser. No. 800,483
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 R **16 Claims**

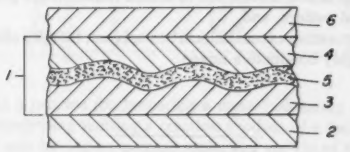
1. A heterogeneous photoconductive insulating composition comprising particles of an organic photoconductor chemically sensitized with a monomeric hexachlorocyclopentene and dispersed in a cellulose nitrate binder.

6. A heterogeneous photoconductive insulating composition comprising particles of anthracene, p-terphenyl, p-quaterphenyl, or a tetraphenylbutadiene chemically sensitized with chlorendic anhydride or chlorendic acid, and dispersed in cellulose nitrate.

4,082,551
ELECTROPHOTOGRAPHIC ELEMENT CONTAINING A MULTILAYER INTERLAYER

David J. Steklenski, and Evelio A. Perez Albuerne, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 783,365, Mar. 31, 1977, abandoned. This application May 26, 1977, Ser. No. 800,839
Int. Cl.² G03G *5/14*
U.S. Cl. 96—1 PC **18 Claims**

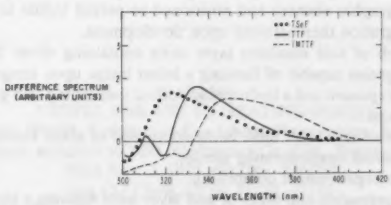


1. In a unitary photoconductive element comprising an electrically conducting layer, a photoconductive layer overlying said conducting layer, and a multilayer interlayer composition interposed between said conducting layer and said photoconductive layer, the improvement wherein said multilayer interlayer composition comprises a first layer containing an acidic polymer material, a second layer containing a basic polymer material, and at the interface of said first and second layers an acid-base reaction product zone formed by said acidic and basic polymer materials.

4,082,552
PROCESS OF OPTICALLY PRINTING HIGHLY CONDUCTIVE CHARACTER UTILIZING A MEDIUM CONTAINING A HALOGENATED HYDROCARBON PHOTOACTIVATOR AND A TETRATHIAFULVALENE OR A RELATED COMPOUND THEREOF

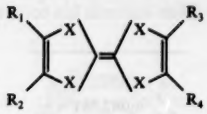
Edward Martin Engler, Wappingers Falls; Frank Benjamin Kaufman, New York, and Bruce Albert Scott, Shrub Oak, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 591,992, Jun. 30, 1975, Pat. No. 4,036,648. This application Feb. 17, 1977, Ser. No. 769,770
Int. Cl.² G03C *5/00*
U.S. Cl. 96—38.4 **11 Claims**



1. A method of producing a highly conductive image comprising the steps of:

(1) depositing an organic π-electron donor compound in a halocarbon on a substrate, said organic donor compond has the empirical formula $C_6H_4X_4R_1R_2R_3R_4$ and the structural formula



where X is selected from the group consisting of O, S, Se and Te and R_1, R_2, R_3, and R_4 is hydrogen, a halogen or an organic substituent selected from the group consisting of an alkyl group, CO_2Me, phenyl groups, and fused cyclics and substituted fused cyclics selected from the group consisting of cyclopentene, cyclohexene, benzene, furan, thiophene, dihydrofuran and dihydrothiophene

(2) exposing said layer of organic π-electron donor compound in said halocarbon to actinic radiation in a predetermined pattern, and

(3) evaporating excess halocarbon solvent, thereby obtaining a highly conductive image.

4,082,553

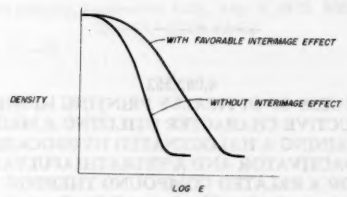
INTERIMAGE EFFECTS WITH SPONTANEOUSLY DEVELOPABLE SILVER HALIDE

Nicholas H. Groet, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 566,648, Apr. 10, 1975, abandoned. This application May 20, 1976, Ser. No. 688,445

Int. Cl.² G03C *1/76, 3/00, 7/00, 7/16*

U.S. Cl. 96—74 **19 Claims**



1. In a process of forming a photographic element capable of forming a reversal image comprising

providing a support, and

coating onto the support two silver halide emulsion layer units primarily responsive to a different portion of the visible spectrum upon imagewise exposure of said photographic element and positioned to permit iodide ion migration therebetween upon development,

each of said emulsion layer units containing silver halide grains capable of forming a latent image upon imagewise exposure and a hydrophilic colloid suspending said grains, and

one of said layer units being comprised of silver haloiodide latent image-forming grains,

the improvement comprising

in preparing one other of said layer units forming a blended silver halide emulsion by interspersing with said hydrophilic colloid suspended latent image-forming silver halide grains hydrophilic colloid suspended, silver halide grains which are surface fogged as though exposed to imaging radiation of maximum intensity to render them spontaneously developable independent of imagewise exposure of said photographic element.

4,082,554

DIRECT-POSITIVE SILVER HALIDE EMULSIONS

Herman Alberik Pattyn, Kapellen; Willy Joseph Vanassche, Kontich, and Herman Adelbert Philippaerts, Edegem, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Mar. 24, 1975, Ser. No. 561,658

Claims priority, application United Kingdom, Apr. 3, 1974, 14801/74

Int. Cl.² G03C *1/36, 1/28*

U.S. Cl. 96—101 **10 Claims**

1. A direct-positive silver halide emulsion comprising reduction- and gold-fogged silver halide grains and at least one electron accepting compound having an anodic polarographic half-wave potential and a cathodic polarographic half-wave potential, which when added together give a positive sum, wherein the silver halide grains have an average grain diameter of less than 100 nm, the silver halide grains are fogged with, per mole of silver halide, from about 0.07 to about 0.5 milliequivalents of reduction-fogging agent and from about 0.01 to about 0.1 millimole of gold fogging agent, and the emulsion comprises per mole of silver halide more than 2 g and at most 10 g of electron-accepting compound(s).

4,082,555

PHOTOTHERMOGRAPHIC MATERIALS AND PROCESS

Paul Barrett Merkel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,366

Int. Cl.² G03C *1/02, 5/24, 1/76, 1/00*

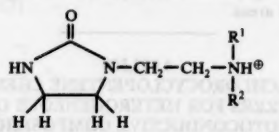
U.S. Cl. 96—114.1 **24 Claims**

24. A covering power imaging, heat developable and heat stabilizable photographic element comprising a support having thereon a layer comprising

(a) photographic silver halide,

(b) a 3-pyrazolidone silver halide developing agent,

(c) an activating concentration within the range of 0.4 to 3.0 moles per mole of silver of a development activator precursor having a pKa within the range of about 8 to 12 and represented by the formula: $A^{\oplus} \cdot B^{\oplus}$ wherein $A^{\oplus}$ is



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen and alkyl containing 1 to 10 carbon atoms; and

$B^{\ominus}$ is alpha-sulfonylacetic acid, and wherein said activator precursor releases a non-volatile amine moiety at a temperature within the range of 120° to 200° C,

(d) a polymeric binder, and wherein said element (1) contains no separate post-processing image stabilizer, and (2) provides silver image development efficiency of at least 90% when heated to a temperature within the range of 120° to 200° C.

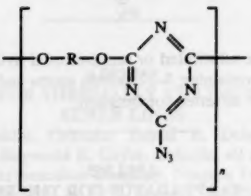
4,082,556

LIGHT-SENSITIVE POLYMERIC COMPOUNDS

Donald Noel Hunter, Great Bookham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 490,724, Jul. 22, 1974, Pat. No. 3,962,241.
This application Mar. 9, 1976, Ser. No. 665,271
Claims priority, application United Kingdom, Jul. 31, 1973, 36289/73
Int. Cl.[2] G03C *1/65, 1/70*
U.S. Cl. 96—115 R 10 Claims

1. A light sensitive composition comprising a mixture of a light sensitive polymeric compound of the formula



in which formula
n is a whole number from 2 to 120
and R represents
phenylene - 1, 3
phenylene - 1, 4
1-phenylcarbonyl-phenylene - 2,4
1-phenylcarbonyl-phenylene - 2,6
2,2′ - diphenylcarbonyl
2,3′ - diphenylcarbonyl
or an
1-alkylcarbonyl-phenylene - 2,5
1-alkylcarbonyl-phenylene - 2,4 or
1-alkylcarbonyl-phenylene -2,6
in which the alkyl group contains from 1 to 4 carbon atoms,
naphthylene - 2,7
naphthylene - 2,6 or
naphthylene - 2,4 - group
wherein the phenyl groups, if desired, are substituted with one or two alkyl groups containing from 1 to 4 carbon atoms or a phenyl group and an inert organic liquid carrier therefor.

4,082,557

SILVER BASE ACTIVATING SOLUTIONS FOR ELECTROLESS COPPER DEPOSITION

Pietro Pizzio, Turin, Italy, assignor to Alfachimici S.p.A., Turin, Italy

Filed Jul. 19, 1976, Ser. No. 706,595
Claims priority, application Italy, Jul. 25, 1975, 68938 A/75
Int. Cl.[2] C23C *3/02*
U.S. Cl. 106—1.11 8 Claims

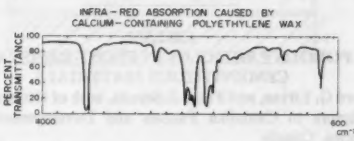
1. A silver base activating solution for activating a workpiece for the electroless deposition thereon of copper, consisting essentially of an aqueous solution containing cations of silver and anions of at least one weak oxyacid selected from the group consisting of boric acid, silicic acid, vanadic acid, arsenic acid, molybdic acid, and wolframic acid, the silver concentrations being from 0.01 g/l to 1 g/l, and the acid concentration being such that the pH of the solution is not less than 7.3, with reference to the activating solution in conditions of use.

4,082,558

NOVEL POLYOLEFIN WAXES AND AQUEOUS POLISHING EMULSIONS THEREOF

Yokoyama Nobuo, Yokohama, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1975, Ser. No. 624,216
Claims priority, application Japan, Oct. 22, 1974, 49-121000; Oct. 22, 1974, 49-121001; Dec. 13, 1974, 49-142594
Int. Cl.[2] C09G *1/08*
U.S. Cl. 106—10 13 Claims



1. In a process for preparing a metal-containing polyolefin wax comprising melting a reaction product of a starting polyolefin wax having an average molecular weight of 400 – 1,500 and an ethylenically unsaturated dibasic acid having 4 – 5 carbon atoms or anhydride thereof and reacting the melted reaction product with a metal compound in which the metal is selected from the metals of Group II of the Periodic Table, to produce an acid-modified polyolefin wax, the improvement which comprises reacting said acid-modified polyolefin wax and Group II metal compound at 100°–200° C in the presence of water or a volatile acid as a catalyst thereby to obtain the metal-containing polyolefin wax.

4,082,559

CEMENTED CARBIDE PRODUCTS AND MANUFACTURING METHOD

Minoru Mishuku, Hiratsuka; Taro Edo, Tokyo, and Nobujiro Tsuchiya, Yamato, all of Japan, assignors to Fuji Die Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 760,961
Claims priority, application Japan, Aug. 31, 1976, 51-103187
Int. Cl.[2] C04B *35/56*
U.S. Cl. 106—43 7 Claims

1. Cemented carbide products made by a method in which a compact of virgin powder of WC-based cemented carbide and a compact of the powder reclaimed from cemented carbide scrap are united together and sintered to produce a metallic bond in the boundary zone between the two compacts, thereby perfectly integrating them into a single unit.

4,082,560

VESSEL FOR USE IN HEATING FOOD

Yutaka Otoshi, Tokyo, and Ken Ishino, Nagareyama, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1976, Ser. No. 738,050
Int. Cl.[2] C04B *33/24, 35/26, 35/16*
U.S. Cl. 106—45 4 Claims

1. A vessel for use in heating food consisting essentially of a sintered body of 4 to 40% by weight of a ferrite component of the formula MFe_2O_4 in which M is a bivalent metal selected from the group consisting of Mn, Mg, Zn, Fe, Ni and Cu, and 96 to 60% by weight of a mineral component of the formula $Li_2O.Al_2O_3.nSiO_2$ in which *n* is 4 or 8.

4,082,561

METHOD FOR EXECUTION OF QUICK HARDENING CEMENT

Koji Nakagawa, and Kenkiti Hirano, both of Niigata, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 480,067, Jun. 17, 1974, Pat. No. 3,973,978.
This application Apr. 20, 1976, Ser. No. 678,569
Claims priority, application Japan, Jun. 15, 1973, 48-67448
Int. Cl.[2] C04B 7/35
U.S. Cl. 106—89 5 Claims

1. A quick hardening agent for cement consisting essentially of a mixture of an amorphous 12 $CaO.7Al_2O_3$ and an anhydrous gypsum in a weight ratio of 1:0.5 to 1:15.

4,082,562

POROUS PARTICLES IN FROST-RESISTANT CEMENTITIOUS MATERIALS

Gerhard G. Litvan, and Peter J. Sereda, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 15, 1976, Ser. No. 741,792
Claims priority, application Canada, Dec. 4, 1975, 241032
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—97 12 Claims

1. A method of producing frost-resistant concrete and other cementitious materials comprising:

(a) selecting a particulate porous material having a selected particle size in the range between 290 and 850 microns, a total porosity of at least 30% and a selected pore size distribution in the range of 0.05 to 3 microns; and

(b) mixing said particulate porous material into said cementitious material in an effective amount up to 30% by weight of cement so as to produce a frost-resistant material which will withstand at least 300 freeze-thaw cycles as measured by the method of ASTM C-666 without significant change in length or modulus.

4,082,563

SAG RESISTANT MORTAR COMPOSITIONS

Jeffrey R. Ellis, Hightstown, N.J., and Herman B. Wagner, Perkasie, Pa., assignors to Tile Council of America, Princeton, N.J.

Filed Dec. 20, 1976, Ser. No. 749,946
Int. Cl.[2] C04B 7/35
U.S. Cl. 106—90 38 Claims

1. A dry water mixable composition for forming, with water, a sag resistant hydraulic cementatious composition comprising:

a. hydraulic cement; comprising at least 20% by weight of composition;

b. at least one water soluble high molecular weight polymer comprising at least 0.2% by weight of composition.

c. at least one metal salt, said salt capable of forming a gelatinous or hydrated hydroxide in the presence of aqueous base comprising from 0.2–5.0% by weight of composition.

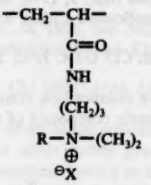
4,082,564

SUGAR DECOLORIZING QUATERNARY AMMONIUM ACRYLAMIDE RESINS

William Fries, South Hampton, and Silvia Napierski, Andalusia, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 615,144, Sep. 19, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,618
Int. Cl.[2] C13D 3/00
U.S. Cl. 127—46 A 8 Claims

1. A process for decolorizing aqueous sugar solutions which comprises contacting the solution with a crosslinked, macroreticular, quaternary ammonium acrylamide resin which comprises the product of a compound of the formula RX with a crosslinked, macroreticular tertiary amine, acrylamide precursor resin which comprises a copolymer of 0.1%–50% by weight of a polyethylenically unsaturated monomer and 50%–99.9% by weight of a monoethylenically unsaturated aliphatic ester of acrylic acid which has been aminolyzed with a polyamine, said resin comprising units having the chemical formula:



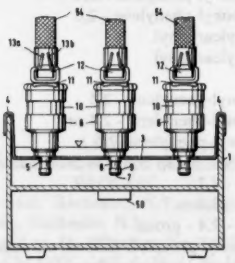
wherein R is a substituted or unsubstituted hydrocarbyl functional group containing 5–22 carbon atoms and X is an anion, either alone or in series combination.

4,082,565

METHOD AND APPARATUS FOR THE REMOVAL OF DEPOSITS FROM A FUEL INJECTION VALVE

Rino Sjölander, Slanbarsvagen 5, 442 00 Kungalv, Sweden

Filed Dec. 9, 1976, Ser. No. 749,619
Claims priority, application Sweden, Dec. 15, 1975, 7514128
Int. Cl.[2] B08B 3/12
U.S. Cl. 134—1 6 Claims



1. A method for the removal of deposits from a fuel injection valve of the type containing a reciprocatory sprayer needle unit and a solenoid for operating said sprayer needle unit, said sprayer needle unit including a valve member, comprising the steps of immersing at least a front portion of the valve in a pool of liquid detergent, and subjecting said pool to ultrasonic vibrations while maintaining a current of a liquid detergent through the valve and maintaining a reciprocatory motion of the sprayer needle unit by supplying a periodic electric current to the solenoid of the valve.

4,082,566

MOLTEN SALT LEACH FOR REMOVAL OF INORGANIC CORES FROM DIRECTIONALLY SOLIDIFIED EUTECTIC ALLOY STRUCTURES

Ronald H. Arendt; Marcus P. Borom; Irvin C. Huseby, all of Schenectady, and Frederic J. Klug, Amsterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,749
Int. Cl.[2] B08B 3/10; B22D 29/00
U.S. Cl. 134—2 16 Claims

1. A method for removing ceramic cores from castings of superalloy materials including the process steps of

a. preparing a molten salt bath of a leachant salt composition which is one selected from the group consisting of M_3AlF_6, M_3AlF_6 + MF, M_3AlF_6 + $M'F_2$ and M_3AlF_6 + MCl wherein

M is a chemical element selected from the group consisting of Li, Na and K, and

M' is a chemical element which is one selected from the group consisting of Mg, Ca, Ba and Sr;

b. covering the molten salt bath with an inert atmosphere having an oxygen content of less than 50 p.p.m.;

c. immersing the casting and the ceramic core in the molten salt bath;

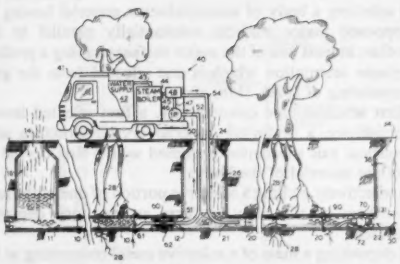
d. leaching the core material from the casting in the molten salt bath, and

e. rinsing the casting to remove leachant products from the casting.

4,082,567
METHOD FOR THERMALLY KILLING ROOTS IN SEWER LINES

James T. Conklin, Orlando; Daniel R. Daley, Altamonte Springs, and Raymond K. Geyer, Orlando, all of Fla., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Jul. 26, 1976, Ser. No. 708,535
Int. Cl.² B08B *3/10, 9/02*
U.S. Cl. 134—10 **21 Claims**



1. A method for using a liquid to kill roots and other living matter in a sewer line, said method comprising the steps of:

a. heating the liquid external to said sewer line;

b. isolating a length of the sewer line from adjacent lengths of sewer line;

c. filling said isolated length of sewer line with said heated liquid at a temperature sufficient to transfer a temperature of at least about 140° F. to all of the natural enzymes of said roots for a lethal period of time, thereby allowing said heated liquid to act as a thermal herbicide for killing the roots and other living matter therein.

4,082,568
SOLAR CELL WITH MULTIPLE-METAL CONTACTS

Joseph Lindmayer, 1335 Piccard Dr., Rockville, Md. 20850

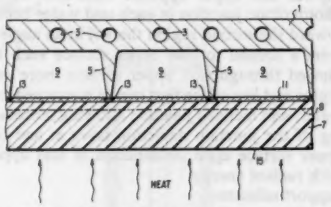
Filed May 10, 1977, Ser. No. 795,550
Int. Cl.² H01L *31/06*
U.S. Cl. 136—89 CC **5 Claims**

1. A solar cell comprising a body of semiconductor material and at least one contact adhered thereto for accepting and directing a flow of electricity away from said article, said contact comprising a first layer of an element from the titanium group in contiguous relationship with said article, a second layer comprising a mixture of a titanium group element and an element selected from the platinum group overlying said first layer, a third layer comprising an element from the platinum group overlying said second layer, and a body of contact metal overlying said third layer, each of said layers being in firm adherence to its adjoining layers.

4,082,569
SOLAR CELL COLLECTOR

John C. Evans, Jr., North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 22, 1977, Ser. No. 770,869
Int. Cl.² H01L *31/04, 31/06*
U.S. Cl. 136—89 CC **8 Claims**



1. A photovoltaic device having a transparent collector layer thereon, which comprises:

a photovoltaic substrate coated with a transparent, conductive mixed metal oxide collector layer containing a continuous pattern of higher conductivity metal channels therein, the metallic elements of said mixed metal oxide collector layer being the same as the metallic elements of said conductive channels.

5. A photovoltaic device having a transparent collector layer thereon comprising,

a photovoltaic substrate,

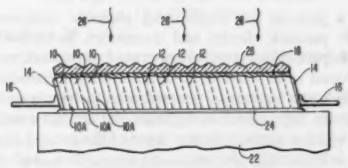
a transparent, conductive mixed metal oxide collector layer on said substrate, and

a plurality of higher conductivity metal channels contained in said collector layer, the metallic elements in said collector layer and conductive channels comprising mixtures of indium and tin, indium and arsenic, and indium and antemony.

4,082,570
HIGH INTENSITY SOLAR ENERGY CONVERTER

Robert E. House, Reading; Robert A. Irvin, and Daniel F. Kane, both of Sudbury, all of Mass., assignors to Semicon, Inc., Burlington, Mass.

Filed Feb. 9, 1976, Ser. No. 656,343
Int. Cl.² H01L *31/06*
U.S. Cl. 136—89 SJ **12 Claims**



1. A photovoltaic energy converter for converting incident radiant energy to electrical energy comprising

A. an incident radiant energy responsive slab including

i. a plurality of wafers of semiconductive material of a first conductivity type, each said wafer including

a. first and second opposed end faces,

b. a first region below the first end face having a net impurity concentration of a second conductivity type,

c. a second region below the second end face having a net impurity concentration of the first conductivity type greater than the concentration in

d. a base region located between said first and second regions, and

e. a photovoltaic junction separating said first and base regions,

ii. a plurality of electrically conductive layers,

iii. said wafers and said conductive layers being stacked in alternate layers and fused together to form said slab, the first region in each said wafers being directed toward the same end of said slab, and

iv. lower and upper opposed transverse surfaces, said photovoltaic junction in each said wafer being inclined toward the second region thereof at an angle deviating from a normal to said upper surface such that when viewed through said upper surface more of the base region and less of the first region is exposed in each said wafer, said inclined junction allowing increased spreading of the junction depletion layer at and below said upper surface upon illumination of said upper surface with radiant energy;

B. a support substrate;

C. means for mounting said slab on said substrate so that the lower transverse surface thereof is adjacent said substrate, said slab being positioned on said substrate for exposure to the incident radiant energy along a direction essentially normal to the upper transverse surface of said slab; and

D. electrical contact means contacting opposed ends of said slab.

4,082,571

PROCESS FOR SUPPRESSING PARASITIC COMPONENTS UTILIZING ION IMPLANTATION PRIOR TO EPITAXIAL DEPOSITION

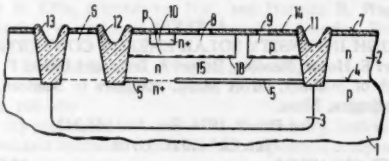
Juergen Graul, Gruenwald, and Helmuth Murrmann, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 9, 1976, Ser. No. 647,857

Claims priority, application Germany, Feb. 20, 1975, 2507366

Int. Cl.[2] H01L *21/265, 21/324, 21/20*

U.S. Cl. 148—1.5 **13 Claims**



1. In a process for suppressing parasitic components, in particular parasitic diodes and transistors, in circuits which possess, in particular, inversely operated transistors, in which a highly doped zone of a second conductivity is introduced into and extends to a surface of a semiconductor substrate of a first conductivity type which is opposite the second conductivity type, in which a semiconductor layer of the second conductivity type is epitaxially deposited on the surface, and in which zones of differing conductivity types are produced in the semiconductor layer to form at least one component which is electrically insulated from adjacent components, the improvement therein comprising:

prior to deposition of the semiconductor layer, forming a layer for controlling the number of charge carriers at parasitic pn junctions subsequently formed by the semiconductor layer and the zones produced therein by implanting ions into the surface of the semiconductor substrate at points suitable to suppress parasitic components while simultaneously chemically reacting the ions with the atoms of the substrate to form molecules,

controlling the implantation energy to obtain an implantation concentration at the surface of the substrate which will not impair regeneration of the crystal lattice during a following healing step, and

thermally healing the surface of the substrate.

4,082,572

PROCESS FOR MAKING ANISOTROPIC RESISTOR FOR ELECTRICAL FEED THROUGHS

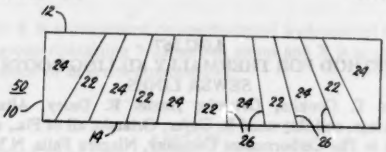
Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 545,482, Jan. 30, 1975, Pat. No. 4,032,960.

This application Sep. 8, 1976, Ser. No. 721,537

Int. Cl.[2] H01L *21/76, 21/72*

U.S. Cl. 148—1.5 **20 Claims**



1. A process for making an anisotropic resistor comprising the process steps of:

(a) selecting a body of semiconductor material having two opposed major surfaces substantially parallel to each other, at least one of the major surfaces having a preferred planar orientation which is one selected from the group consisting of (100), (110) and (111),

a first selected type conductivity, a first selected level of resistivity, a preferred material crystal structure and a vertical axis substantially aligned with a first crystal axis of the material of the body;

(b) selectively etching a selective portion of one of the major surfaces of the body to form at least one depression therein;

(c) depositing a mass of a selective metal comprising at least one dopant impurity metal suitable for imparting a second selected type conductivity and a second level of resistivity to the material of the body in the at least one depression in the one major surface of the body of semiconductor material;

(d) heating the body and the at least one mass of metal to an elevated temperature to produce a melt of metal-rich semiconductor material in each etched depression;

(e) establishing a first thermal gradient aligned substantially parallel with the vertical axis of the body;

(f) migrating the at least one melt of metal-rich semiconductor material through the body in the direction of the higher temperature of the thermal gradient from the one major surface to the other of the two major opposed surfaces to form an electrically conductive channel region of recrystallized material of the body having two opposed end surfaces, each end surface being coextensive with a respective one of the two opposed major surfaces, the recrystallized material having the at least one dopant metal impurity therein to impart a second selected type conductivity and a second selected level of resistivity thereto as determined by the level of concentration of that dopant impurity metal in the recrystallized semiconductor material of the channel region;

(g) introducing a second thermal gradient into the body while maintaining the first thermal gradient and simultaneously migrating the at least one melt of metal-rich semiconductor material through the body, the second thermal gradient being a radial thermal gradient to change the direction and cross-sectional area of each melt within the body during migration to produce at least one channel region whic has an increasing cross-sectional area with increasing distance from one major surface to the other major surface and a vertical axis which is not parallel with

the vertical axis of the body and the first crystal axis of the material of the body, and

(h) affixing an ohmic electrical contact to each end surface of each channel region.

4,082,573

HIGH TENSILE STRENGTH ALUMINUM ALLOY CONDUCTOR AND METHOD OF MANUFACTURE

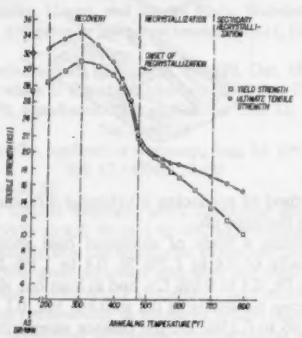
Roger J. Schoerner, and Enrique C. Chia, both of Carroll County, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 430,300, Jan. 2, 1974, Pat. No. 3,920,411, which is a continuation of Ser. No. 199,729, Nov. 17, 1971, abandoned, which is a division of Ser. No. 54,563, Jul. 13, 1970, abandoned. This application Nov. 18, 1975, Ser. No. 633,072

The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

Int. Cl.[2] C22F *1/04*

U.S. Cl. 148—2 14 Claims



1. Method of manufacturing a high tensile strength aluminum alloy electrical conductor comprising the steps of:

a. alloying a minimum of 93.5 weight percent molten aluminum containing normal trace impurities with at least one additional alloying element in an amount effective to yield intermetallic precipitates during subsequent solidification and thermomechanical processing;

b. casting the molten aluminum alloy into a cast bar at a rate sufficient to form primary intermetallic precipitates of said alloying element from said alloyed molten aluminum;

c. hot-working the cast bar substantially immediately after casting to form rod and to break-up said primary precipitates;

d. drawing said rod through a series of wire-drawing dies, without preliminary or intermediate anneals, to form wire and to further break-up and distribute said primary precipitates throughout the aluminum matrix;

e. annealing said wire at a temperature of from 200°–400° F for a period of time sufficient to precipitate secondary intermetallic compounds of said alloying element from the solid solution; and

f. terminating said annealing step prior to primary recrystallization to permit both said primary and secondary precipitates to pin dislocation sites between adjacent subgrain boundaries and to thus increase the ultimate tensile strength and yield strength of the conductor above the as-drawn condition.

4,082,574

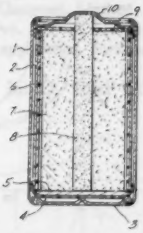
PROCESSING FOR CORROSION RESISTANCE IN ALUMINUM BASE ALLOYS CONTAINING ZINC, MAGNESIUM AND IRON

William H. Anthony, Guilford; Andrew J. Brock, and Damian V. Gullotti, both of Cheshire, all of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 707,185, Jul. 21, 1976. This application Mar. 4, 1977, Ser. No. 774,464

Int. Cl.[2] C22F *1/04*

U.S. Cl. 148—2 11 Claims



1. A method of preparing an aluminum base alloy which is resistant to corrosion comprising the steps of:

a. casting an alloy consisting essentially of 0.2 to 1.0% by weight zinc, up to 5.0% by weight magnesium, less than 0.1% by weight iron, balance aluminum;

b. homogenizing said cast alloy for 4 to 30 hours at 1050°–1125° F;

c. rapidly cooling said homogenized alloy;

d. hot working the quenched alloy at 850° to 1000° F with a reduction of approximately 20% during each pass through the hot working station;

e. cold working the alloy with a reduction of approximately 20% during each pass through the cold working station;

f. heating the cold worked alloy for 5 to 30 minutes at 750° to 1050° F;

g. cold working said alloy down to the final desired working thickness; and

h. heating said cold worked alloy for 1 to 25 minutes at 100° to 800° F.

4,082,575

PRODUCTION OF LIQUID COMPATIBLE METALS

George Y. Eastman, Lancaster, Pa., assignor to Thermacore, Inc., Leola, Pa.

Filed Apr. 21, 1976, Ser. No. 679,038

Int. Cl.[2] C23F *7/04*

U.S. Cl. 148—6.35 4 Claims

1. A method of making a water compatible steel heat pipe which comprises:

selecting a steel with a thermal expansion rate sufficiently similar to that of aluminum oxide to prevent cracking and spalling of an aluminum oxide coating during thermal cycling and containing between one-half and five percent aluminum as an alloying metal;

performing all required forming operations to shape said steel into the casing of a heat pipe;

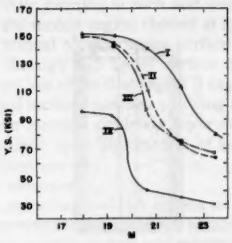
heating said casing within an environment of clean, dry air to a temperature of between 500° to 1000° Centigrade for between one and ten hours, diffusing the aluminum alloying metal to the surface of said casing and causing a chemical reaction to occur between the aluminum and the oxygen of the air to form a continuous adherent water compatible surface coating of aluminum oxide of approximately one micron depth; and

using said surface coated casing as a component of a heat pipe assembled by conventional methods.

4,082,576
ULTRA-HIGH STRENGTH LOW ALLOY TITANIUM BEARING FLAT ROLLED STEEL AND PROCESS FOR MAKING

Peter B. Lake; John J. Grenawalt, and Ronald L. Pastorek, all of Boardman Township, Mahoning County, Ohio, assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Oct. 4, 1976, Ser. No. 729,614
Int. Cl.² C21D *1/80*
U.S. Cl. 148—12 F 20 Claims

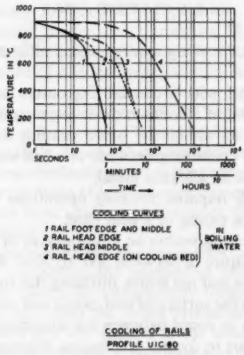


1. A method of producing a precipitation strengthened cold rolled steel, which method comprises:
(a) hot rolling a slab to a hot band having a finishing temperature above 1500° F;
(b) coiling said band at a temperature below 1250° F;
(c) cold reducing said band in the order of 40 to 90%; and developing a yield strength after rolling of at least 125 ksi; and
(d) annealing the cold reduced steel at a temperature and for a time, temperature-time parameter M, such that will produce a fine dispersion of strengthening precipitates in a microstructure which is at least 50% of the recovery type and no greater than 50% of the recrystallized type and is sufficient for the steel to retain a yield strength of at least 120 ksi;
the composition of said steel consisting essentially of, in percent by weight: 0.04 – 0.15 C; 0.20 – 1.5 Mn; 0.10 – 0.32 total Ti; 0.02 – 0.20 soluble Ti; 0.01 – 0.12 Al; or other killing agent; 0 – 0.30 Si; and the balance being essentially iron and residual impurities, the total Ti to C ratio being at least 2/1.

4,082,577
PROCESS FOR THE HEAT TREATMENT OF STEEL

Wilhelm Heller, Rheinhausen, Germany, assignor to Fried. Krupp Huttenwerke AG, Bochum, Germany

Filed Aug. 14, 1975, Ser. No. 604,862
Claims priority, application Germany, Aug. 16, 1974, 2439338
Int. Cl.² C21D *9/04*
U.S. Cl. 148—12.1 15 Claims



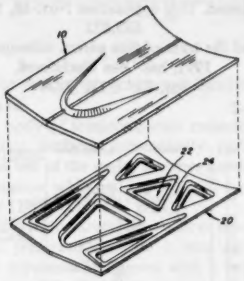
1. A process for the heat treatment of a steel rail which is at a temperature which is in the austenite range, which process consists essentially of quenching at least the head portion of said rail in boiling water, maintaining the rail in said water until it reaches a temperature of 100° C and recovering a rail whose steel composition is characterized by such a very fine pearlitic structure that it cannot be resolved by a light microscope but is not bainitic in structure.

3. A process according to claim 1 wherein quenching is carried out from rolling heat.

4,082,578
ALUMINUM STRUCTURAL MEMBERS FOR VEHICLES

Joseph W. Evancho, Pittsburgh; Barrie S. Shabel, Murrysville, and William G. Truckner, Avonmore, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 5, 1976, Ser. No. 711,954
Int. Cl.² C22F *1/04*
U.S. Cl. 148—12.7 A 54 Claims



1. A method of producing a vehicular structural member, comprising the steps of:
(a) providing a body of aluminum base alloy consisting essentially of 0.4 to 1.2% Si, 0.4 to 1.1% Mg, 0.05 to 0.35% Fe, 0.1 to 0.6% Cu, and at least one element from the group consisting of 0.2 to 0.8% Mn, 0.1 to 0.3% Cr and 0.05 to 0.15% Zr, the balance essentially aluminum and incidental elements and impurities;
(b) working said body to produce a wrought aluminum product;
(c) solution heat treating said wrought aluminum product at a temperature within the range of 900° to 1100° F;
(d) quenching said product;
(e) aging said product to a condition having a substantially stable level of mechanical properties to provide a solution heat treated, quenched and aged product that is readily formable and has a yield strength of 12 to 35 ksi; and
(f) forming said aged product in said condition into said structural member.

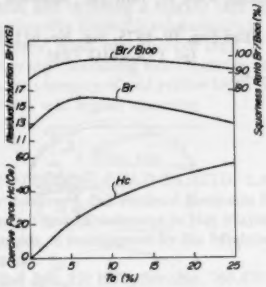
4,082,579
RECTANGULAR HYSTERESIS MAGNETIC ALLOY

Hakaru Masumoto, Sendai; Yuetsu Murakami, Izumi, and Naoji Nakamura, Sendai, all of Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Japan

Continuation-in-part of Ser. No. 548,977, Feb. 11, 1975, abandoned. This application Oct. 29, 1976, Ser. No. 737,054
Int. Cl.² C04B *35/00*
U.S. Cl. 148—31.55 9 Claims

1. A rectangular hysteresis magnetic alloy consisting of 0.5 to 25% by weight of tantalum and the balance of iron, said

alloy being cold worked and then heat treated and having a coercive force of more than 2 oersteds, a residual induction of



more than 12700 gauss and a squareness ratio of more than 80%.

4,082,580

IRON-NICKEL-MOLYBDENUM ALLOY HAVING IMPROVED STABILITY AND HIGH INITIAL PERMEABILITY

Friedrich Pfeifer, Hanau, and Günter Klein, Weinheim, both of Germany, assignors to Vacuumschmelze GmbH, Hanau, Germany

Continuation-in-part of Ser. No. 298,690, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 55,569, Jul. 16, 1970, abandoned. This application Oct. 31, 1974, Ser. No. 519,721

Claims priority, application Germany, Aug. 12, 1969, 1940923

Int. Cl.² C04B *35/00*

U.S. Cl. 148—31.55 **3 Claims**

1. A heat treated magnetic alloy consisting essentially of from 33 to 35% nickel, from 1 to 4% molybdenum and the balance essentially iron the alloy prior to the last cold working exhibiting a fine grain structure and after the final heat treatment exhibiting a completely secondarily recrystallized structure, an initial permeability in excess of 20,000 Gauss/oersted and stability preventing substantial transformation to martensite at temperatures of −320° F.

4,082,581

NICKEL-BASE SUPERALLOY

Subrata Ghosh, Southfield, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 9, 1973, Ser. No. 386,894

Int. Cl.² C22C *19/05*

U.S. Cl. 148—32 **3 Claims**

1. An alloy having a nominal composition consisting essentially of the following constituents in about the stated weight percentages:

Aluminum	6.75 – 10.00
Chromium	9.00 – 11.00
Titanium	0.80 – 2.50
Cobalt	3.00 – 4.50
Molybdenum	2.50 – 4.00
Tantalum	0.95 – 4.85
Tungsten	0. – 1.25
Columbium	0. – 0.60
Carbon	0.30 – 0.50
Boron	0.03 – 0.25
Zirconium	0. – 0.80
Rare Earths	0.02 – 0.05
Beryllium	0. – 0.05

Nickel (including incidental impurities) the balance, and wherein the alloy is particularly characterized by a room temperature gamma prime type of matrix and by the formation of a delta NiAl type of precipitate within the matrix at elevated temperatures.

4,082,582

AS - CAST PERMANENT MAGNET SM-CO-CU MATERIAL, WITH IRON, PRODUCED BY ANNEALING AND RAPID QUENCHING

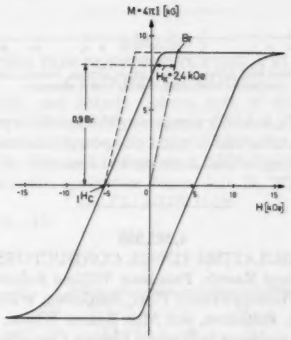
Anton Menth; Anthony J. Perry, both of Nussbaumen, and Ulrich Spinner, Aeugst, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 2, 1975, Ser. No. 637,057

Claims priority, application Switzerland, Dec. 18, 1974, 16878/74

Int. Cl.² H01F *1/02*

U.S. Cl. 148—102 **4 Claims**



1. A method of producing permanent-magnet material having the composition $Sm(Co_{1-x-y}Fe_xCu_y)_z$ wherein $0 < x < 0.2$, $0.1 < y < 0.3$ and $6.5 < z < 7.5$, which comprises:

melting together said elements in amounts according to said composition,

solidifying the melt by slowly cooling said melt,

annealing the alloy of the melted together elements at temperatures between 1150° and 1250° C,

subsequently rapidly quenching said alloy, and

further annealing said alloy at temperatures between 750 and 850° C.

4,082,583

SOLVENTLESS DOUBLE BASE PROPELLANTS AND METHOD FOR PLASTICIZING MTN NITROCELLULOSE PROPELLANTS WITHOUT USE OF SOLVENTS

Paul R. Mosher, Indian Head, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 14, 1974, Ser. No. 435,391

Int. Cl.² C06B *25/18*

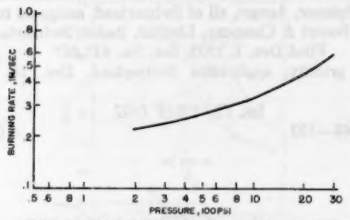
U.S. Cl. 149—96 **6 Claims**

1. A metriol trinitrate plasticized double-base propellant having about 30 to about 70 weight percent nitrocellulose, an energetic plasticizer consisting of about 30 to 60 weight percent metriol trinitrate and about 2 to 20 weight percent triethylene glycol dinitrate which is prepared by the solventless process wherein the process includes slurrying any grade of nitrocellulose with warm water, adding to said slurry the desired additives, filtering or centrifuging said slurry so as to form a paste, aging said paste and milling said aged paste on a heated rolling mill so as to form a homogenous colloided propellant.

4,082,584
BALLISTIC MODIFIER

Daniel R. Satriana, Verona, and Arthur J. Bracuti, Dover, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 11, 1971, Ser. No. 114,707
Int. Cl.[2] C06B *43/00*
U.S. Cl. 149—109.4 13 Claims



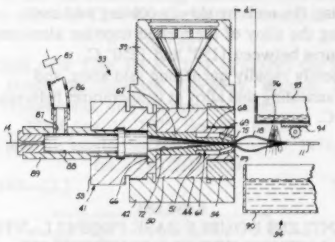
BURNING RATE CURVE OF HMX (30%) PLASTISOL PROPELLANT CONTAINING PYROLYZED $PbSnO_3$ /UREA MODIFIER

1. A ballistic modifier comprising the pyrolysis product of a mixture of a urea and a metal compound selected from the group consisting of lead stannate and a mixture of lead oxide and tin oxide.

4,082,585
INSULATING TINSEL CONDUCTORS

William Michael Kanotz, Pasadena; William Robert Lockhart, Baltimore; George Francis Piper, Baltimore; William Charles Vesperman, Baltimore, and Max Kearns Wilson, Baltimore, all of Md., assignors to Western Electric Company, Inc., New York, N.Y.

Filed May 27, 1976, Ser. No. 690,802
Int. Cl.[2] H01B *13/14*
U.S. Cl. 156—51 5 Claims



1. A method of covering a tinsel conductor with a polyether polyester thermoplastic copolymer, which includes the steps of:

advancing a tinsel conductor which includes a core and a plurality of tinsel ribbons wrapped thereabout;

extruding an insulation cover comprising a polyether polyester thermoplastic copolymer about the advancing tinsel conductor with the temperature of the extrudate being greater than but as close as possible to the melting point of the copolymer;

introducing a gas between the tinsel conductor and the extrudate to expand the extrudate outwardly from the tinsel conductor for a predetermined time prior to the proximate engagement of the extrudate with the tinsel conductor to cool the copolymer and to initiate oriented crystalline growth of the copolymer; then

drawing down the insulation cover concentrically about the tinsel conductor; while

cooling further the insulation cover.

4,082,586
METHOD OF MAKING MODEL TREES AND ARTICLE

David L. Osment, 9904 W. 70th Ter., Shawnee Mission, Kans. 66203

Filed Sep. 10, 1975, Ser. No. 611,903
Int. Cl.[2] A41G *1/00*
U.S. Cl. 156—61 16 Claims

1. A method of constructing a model tree comprising a relatively thick trunk and a plurality of relatively thin limb portions from a three dimensional pattern and a mold utilizing centrifugal casting techniques, said method comprising:

forming said mold to present a mold cavity presenting said trunk and limb portions conforming to the shape of said pattern;

providing a molten metal composition comprising at least 60% by weight lead;

introducing into said mold cavity a quantity of said molten metal;

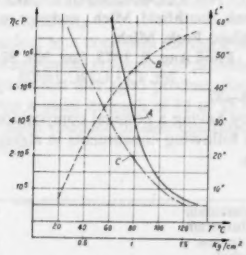
centrifugally casting said molten metal to distribute the latter throughout the mold cavity; and

solidifying said molten metal to present a tree structure.

4,082,587
METHOD AND DEVICES FOR ROAD SURFACE MARKING

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Filed Jan. 26, 1976, Ser. No. 652,523
Claims priority, application Italy, Jan. 24, 1975, 19573 A/75
Int. Cl.[2] E01C *23/16*
U.S. Cl. 156—71 9 Claims



1. A method of forming a traffic - regulating indicium on a pavement, comprising forming a primer layer on said pavement by applying thereto a heated composition in flowable state which is of such a nature that the viscosity thereof increases as the temperature decreases from the temperature of application of said composition to said pavement, said composition having such a viscosity upon application thereof to said pavement that said composition intimately contacts said pavement, and said composition being capable of rapidly attaining a viscosity in the range of about 10^3 to 10^4 cP when said composition has a viscosity below said range upon being applied to

said pavement, said composition further being capable of undergoing an increase in viscosity on said pavement from said range to a higher viscosity of at least 10^5 cP within a period of about 30 seconds; and applying a marker tape to said primer layer when the viscosity thereof is substantially in said range to thereby preliminary bond said marker tape to said primer layer, said marker tape becoming more securely bonded to said primer layer as the viscosity of said primer layer increases from said range towards said higher viscosity.

4,082,588

METAL PROTECTING LEAD/PLASTIC LAMINATE

William Arthur Anderton, and Richard Benjamin Hollis Sewell, both of Victoria, Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence, Canada

Filed Jan. 19, 1977, Ser. No. 760,678
Claims priority, application Canada, Feb. 20, 1976, 246163
Int. Cl.² E04B *1/00*
U.S. Cl. 156—71 **32 Claims**

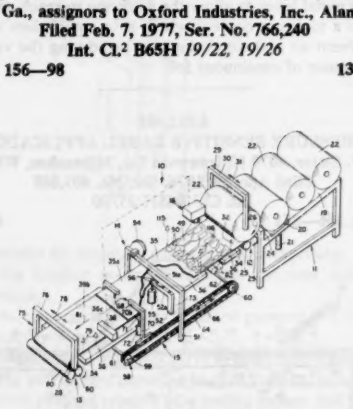
1. A method for protection against electrochemical corrosion of a metal substrate which is subject to said corrosion, said method comprising applying to said substrate a metal-plastic laminate comprising (a) a foil of corrosion-resistant lead, said foil having a thickness from about 1 to about 25 mils; (b) a plastic film of thickness ranging from 0 to about 20 mils, one surface of which is bonded to one surface of said metal foil; and (c) a coating of pressure-sensitive adhesive on the opposite surface of said lead foil; whereby said laminate is bonded to the surface of said substrate by means of said pressure-sensitive adhesive.

4,082,589

CREEL LOADING, CUTTING, AND SPLICING SYSTEM FOR SHEET MATERIAL

Thomas K. Patterson, Dublin; William O. Mitchell; Donald H. Smith, both of Vidalia, and John P. Hunter, Jr., Dunwoody, all of Ga., assignors to Oxford Industries, Inc., Alantic, Ga.

Filed Feb. 7, 1977, Ser. No. 766,240
Int. Cl.² B65H *19/22, 19/26*
U.S. Cl. 156—98 **13 Claims**



1. A process of cutting lengths of sheet material comprising moving sheet material along its length from a supply, projecting an image which includes splice positions on the sheet material and moving the projected image in timed relationship with the sheet material, and cutting the sheet material at locations on the sheet material which have splice positions projected thereon.

6. The process of claim 1 and further including a splicing process comprising the steps of moving the sheet material in a reverse direction and moving the projected image in a reverse direction until a pair of cut positions is projected on the sheet material, marking the sheet material at both of the cut positions, cutting across the sheet material at one of the marked cut positions, moving a new end of the sheet material along its length from the supply into overlapped relationship with the cut end of sheet material, and connecting the new end of sheet material to the cut end of sheet material at the other marked cut position adjacent the cut end of sheet material.

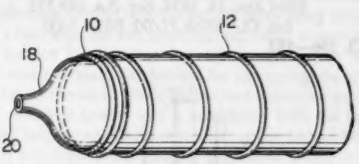
8. The process of claim 1 and further including the step of accumulating the lengths of cut sheet material on spools, and placing the spools in a creel.

4,082,590

PROCESS FOR MANUFACTURING A FLEXIBLE CYLINDRICAL BODY

Norihiko Iida, and Shigeto Gobaru, both of Kawagoe, Japan assignors to National Marineplastic Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 483,059, Jun. 25, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,005
Claims priority, application Japan, Jun. 28, 1973, 48-73074
Int. Cl.² B32B *31/26*
U.S. Cl. 156—144 **8 Claims**



1. A process for manufacturing a flexible cylindrical body comprising: preparing an elongated flexible substantially closed preform envelope having an inlet therein for the admission of an inflation gas, said preform having an elongated cylindrical shape of predetermined diameter and being made of a non-resilient material such that when said preform is inflated it assumes a substantially unstressed cylindrical form; inserting the substantially uninflated preform into an elongated coil of an electrically conductive material which is coated on at least the inner faces of the turns thereof with an adhesive material; the diameter of said preform in its expanded condition being sufficiently large relative to the inner diameter of said coil such that it is capable of engagement with the said coil in said unstressed cylindrical form; inflating said preform into said cylindrical form within said coil and into engagement therewith in an unstressed state; applying a predetermined voltage to said coil for fusing the adhesive material thereon and to secure said coil to said cylindrical preform; and thereafter releasing the inflation gas from the cylindrical preform and obtaining a flexible substantially unstressed cylindrical article without sags or corrugations thereon.

4,082,591

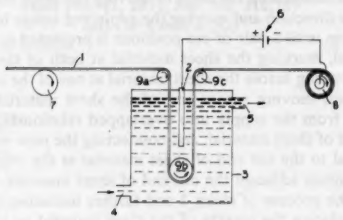
SURFACE TREATMENT PROCESS FOR COPPER FOIL

Shigeyoshi Morisaki, and Nobuo Kitamura, both of Ageo, Japan, assignors to Mitsui-Anaconda Electro Copper Sheet Co., Ltd., Japan

Filed Sep. 28, 1976, Ser. No. 727,624
Claims priority, application Japan, May 15, 1976, 51-27862
Int. Cl.² C25D *1/00*
U.S. Cl. 156—150 **5 Claims**

1. A process for the surface treatment of copper foil, com-

prising electrodepositing, in an alkaline bath containing more than 0.3 g. of Sn/l, at a current density of from about 1 to 3 A-sec/dm^2, on a shiny metallic side of copper foil a thin layer of tin to the extent that the whitish color of the deposited tin is



minimized and the reddish color of the copper surface is maintained, followed by heating the foil so produced to diffuse said tin layer into the copper layer and thereby to produce a thin layer of tin and copper alloy.

4,082,592

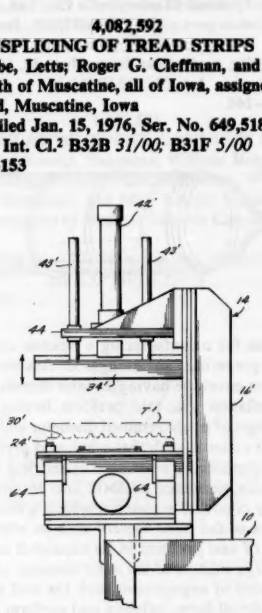
SPLICING OF TREAD STRIPS

Ralph C. Raabe, Letts; Roger G. Cleffman, and Raymond G. Stratton, both of Muscatine, all of Iowa, assignors to Bandag Incorporated, Muscatine, Iowa

Filed Jan. 15, 1976, Ser. No. 649,518

Int. Cl.^{2} B32B *31/00*; B31F *5/00*

U.S. Cl. 156—153 **3 Claims**



1. A method of splicing the ends of two strips of precured rubber tread strips having tread grooves in one surface thereof, said method comprising: transversely cutting a small length from the end of each tread strip at a preselected location along the length thereof; placing the grooved surface of each tread strip in engagement with a complementary ribbed mold element, each tread strip by virtue of the preselected cutting location and engagement of the ribs within the tread grooves being thereby positioned so that the newly exposed end surface of each tread strip projects a predetermined distance beyond its respective mold element; clamping each tread strip against its respective mold element; inserting a vulcanizable rubber-base bonding material between the projecting end surfaces of the strips; imparting relative movement of the clamped tread strips toward each other in the same plane to abut and tightly press the end surfaces of the strips together; and heating the bonding material and the ends of the strips while maintaining the pressing forces in order to effect a bond between the end surfaces of the strips.

4,082,593

PRINTING ON THE SIDES OF PAPER PADS

Roger Hadden-Wight, Chertsey, and Colin Stanley Johnson, Camberley, both of England, assignors to Irvin Bros. (Fleet Works) Limited, England

Filed Jun. 23, 1976, Ser. No. 699,209

Claims priority, application United Kingdom, Jun. 25, 1975, 26966/75

Int. Cl.^{2} B44C *1/24*

U.S. Cl. 156—230 **8 Claims**

1. A method of applying multi-colored visible matter to at least one side surface of a pad of sheet materials in a single operation comprising:

(a) placing a transfer, which comprises a substrate having a first layer of multi-colored visible inks to be applied to the pad of sheet materials and a second layer of varnish based on synthetic plastics material which is compatible with said multi-colored inks, in contact with at least one side surface of the pad of sheet materials such that the layer of varnish contacts said at least one side surface of the pad of sheet materials,

(b) heating said substrate to a temperature of 200° to 300° C and applying a pressure to said substrate of 75 to 125 pounds per square inch for a time period of 10 seconds to 1 minute so as to affix the layer of varnish and the layer of multi-colored visible inks to the adjacent side surface of the pad of sheet materials, and

(c) removing said substrate.

4,082,594

METHOD FOR MAKING A WRAPPING MATERIAL

Ernest Stonehouse, Midsomer Norton, England, assignor to Mardon Flexible Packaging Limited, England

Filed Jan. 26, 1977, Ser. No. 762,661

Claims priority, application United Kingdom, Feb. 4, 1976, 4327/76

Int. Cl.^{2} B32B *29/06*; B05D *3/12*; B32B *3/24, 15/20*

U.S. Cl. 156—253 **7 Claims**

1. A method of making a flexible wrapping material comprising the steps of

(a) applying metal in discrete form to a surface of a dry flexible paper substrate to form a layer having visually the appearance of continuous foil,

(b) and treating the resulting product to form a discontinuous metal layer to allow the substrate to reach and maintain a moisture content which is in equilibrium with the ambient air and simultaneously preserving the visual appearance of continuous foil.

4,082,595

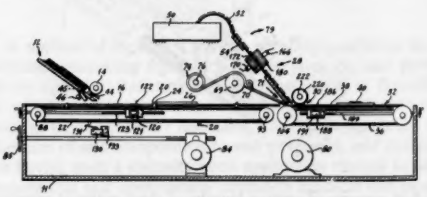
PRESSURE SENSITIVE LABEL APPLICATOR

John W. Slater, 4679 N. Ironwood La., Milwaukee, Wis. 53209

Filed Apr. 29, 1976, Ser. No. 681,865

Int. Cl.^{2} B65H *25/00*

U.S. Cl. 156—351 **4 Claims**



1. Labeling apparatus for dispensing labels from a label

carrier web containing a plurality of spaced labels comprising an article feed conveyor, an outfeed conveyor, label feed means comprising a peel plate extending downwardly and forwardly in the direction of article feed, feed means for drawing a label carrier web along and around said peel plate, a light source located on one side of the web, light sensing means having a first mode when a label is in registry and a second mode when a gap between labels is in registry, second sensing means associated with said outfeed conveyor to sense the presence of an article to be labeled, and circuit means coupled to said first and second sensing means whereby actuation of said second sensing means by an article carried on said outfeed conveyor will cause energization of said label feed means to cause movement of the label web and wherein said first sensor will de-energize said feed means when said light sensing means is in said second mode and a gap between said labels is sensed by said first sensing means to stop movement of the label carrier web whenever a gap between labels is sensed and wherein said light sensing means is a photo transistor, and said circuit means includes a differential amplifier coupled to said phototransistor to provide an output signal when a label is in registry with said phototransistor and no output when a gap between labels is in registry and said circuit including an output switch circuit coupled to said differential amplifier and wherein, said label feed means includes a brake and clutch and said output switch circuit energizes said brake and de-energizes said clutch to stop label feed when said first sensor senses a gap between labels and said brake being de-energized and said clutch being energized when an article is sensed by said second sensing means to cause label feed.

4,082,596

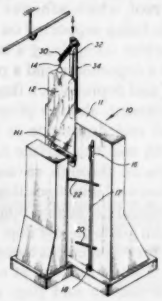
GARMENT BAG SEALING MACHINE

Charles C. Vanderpool, R.D. No. 1, Waverly, N.Y. 14892

Filed Apr. 29, 1977, Ser. No. 792,352

Int. Cl.[2] B32B *31/00*; B65B *1/04*

U.S. Cl. 156—359 **9 Claims**



1. Apparatus for sealing a garment bag, comprising:

means for loading a hanger mounted garment onto said apparatus;

means to support said hanger mounted garment in a vertical orientation on said apparatus;

means connected to and responsive to said loading means for moving said hanger mounted bagged garment to a predetermined position relative to a sealing means; and

a sealing means operated in cooperation with said moving means and said supporting means and for sealing said bag covering said garment at a position on said bag determined by said garment contained therein.

4,082,597

METHOD AND APPARATUS FOR MAKING CONTINUOUS LENGTHS OF RESIN TUBES

Frede Hilmar Drostholm, 2950 Vedbaek, Denmark

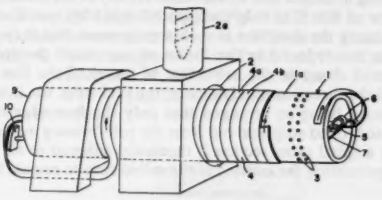
Division of Ser. No. 171,921, Aug. 16, 1971, Pat. No. 3,979,250.

This application Feb. 11, 1976, Ser. No. 657,174

Claims priority, application Denmark, Aug. 21, 1970, 4315/70

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—429 **5 Claims**



1. Apparatus for making tubes of resin material, comprising a supporting structure and an endless carrier strip mounted on the supporting structure, the supporting structure having an external cylindrical surface for supporting the carrrier strip and having a hollow interior hollow extending axially through the supporting structure, and the carrier strip being wound around the supporting structure in a helix having a plurality of helical turns with the inside surface of the turns in engagement with said external cylindrical surface substantially throughout the circumference thereof, and the helical turns being arranged with their edges adjacent and abutting each other to provide an unbroken surface for carrying the resin material from which the tube is being formed, mechanism for advancing the carrier strip with respect to said cylindrical surface through a path one portion of which is helical and is coincident with the helical turns of said helix from the entrance end of the helical path to the delivery end thereof and another portion of which extends through the hollow interior in the supporting structure, said mechanism comprising a motor mounted on the supporting structure and having driving means engaging the carrier strip in its path from the delivery end to the entrance end of the helical path and reacting between the supporting structure and the carrier strip to exert a pulling force upon the carrier strip and advance the strip in said path helically around and with respect to the cylindrical surface of the supporting structure, and a multiplicity of rolling elements recessed into said cylindrical supporting surface and partially projecting from said surface to support the helical turns of the carrier strip throughout the helical portion of its path, said rolling elements being rotatable about axes which are perpendicular to the helical path to provide substantially frictionless travel of the carrier strip relative to the support surface.

4,082,598

APPARATUS FOR MANUFACTURING AN UNTWISTED SYNTHETIC RESIN STRING

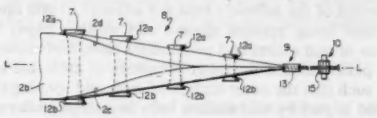
Fusao Katagi, Sakai, Japan, assignor to Katagi Coseikagaku Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 516,958, Oct. 22, 1974, Pat. No. 3,967,038.

This application Apr. 20, 1976, Ser. No. 678,592

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—463 **4 Claims**



1. An apparatus for manufacturing an untwisted synthetic

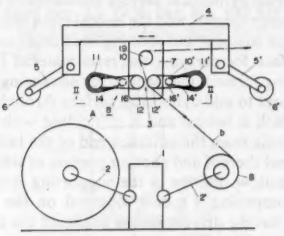
resin string comprising a stretching means for stretching a strip of thermoplastic resin film at least longitudinally thereof, a roll-forming means disposed to the rear of the stretching means for inwardly rolling only one side edge of the stretched film strip, and a heat-setting means disposed to the rear of the roll-forming means, the roll-forming means including a plurality of rolling members each having a curved rolling surface only at one end thereof and a flange at the other end thereof to prevent lateral displacement of the film strip, the rolling members being arranged side by side transversely of the direction of advance of the film strip and spaced apart by specified distances along the direction in such arrangement that the rolling surfaces are reduced in the radius of curvature thereof and positioned closer to the centerline of travel of the film strip toward the direction of advance of the film strip, the heat-setting means being so arranged that only the free edge of the untwisted rolled strip sent out from the roll-forming means and having a spiral cross section is thermally adhered to its outer layer, permitting the interior of the rolled strip to remain loose.

4,082,599

SPLICING ROLLER DEVICE FOR AUTOMATIC PAPER SPLICING APPARATUS

Yasuhiro Kozima, Odawara, Japan, assignor to Nihon Electronic Industry Co., Ltd., Odawara, Japan

Filed May 13, 1976, Ser. No. 686,800
Claims priority, application Japan, Mar. 11, 1976, 51-25543
Int. Cl.[2] B65H *19/18*
U.S. Cl. 156—504 **2 Claims**



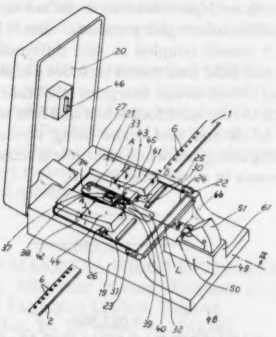
1. A splicing roller device for an automatic paper splicing apparatus of the type wherein a splicing roller is rotated in contact with a new crude paper coil to pick up a double-sided adhesive tape attached to the forward end of the new crude paper coil by the adhesion of the tape, and the crude paper picked up from the coil is adhered to another crude paper being fed to a crude paper processing line to thereby accomplish continuous feeding of crude paper, said splicing roller device comprising a plurality of splicing rollers each attached to the forward end of a rotatable arm to be movable toward and away from the outer peripheral surface of said new crude paper coil, a plurality of endless belts passed around the outer peripheral surface of each said splicing roller to extend in the direction of feeding of said another crude paper and having a width dimension corresponding to part of the length of the respective said splicing roller, the surface of each said splicing roller being made of an adhesive surface which is stickable to said tape, the surfaces of said endless belts being made of a non-adhesive surface which is not stickable to said tape, such that said tape is adhered to the surface of one of said splicing rollers is thereafter separated from said splicing roller surface by said endless belts when said splicing roller is rotated further, the surface of the adhesive tape not adhered to said one splicing roller being pressed against said another paper by the surfaces of said rollers and said endless belts, said endless belts being passed around the outer periphery of each said splicing roller such that the outer surface of each said splicing roller is covered in part by said endless belts in a stripe pattern in the length direction of the splicing roller, the length of the splicing roller surface covered by the stripe pattern being longer than the width of the adhesive tape, the width of one endless belt being smaller than the width of the adhesive tape, a return roller for each of said plurality of endless belts arranged downstream of said splicing rollers in the direction of feed of said another crude paper, the return rollers being movable into and out of engagement with each other, the pitch of said stripe pattern in said length direction of each of said splicing rollers being shifted with respect to one other, whereby when said return rollers come into contact with each other, said endless belts on one of said return rollers do not contact said endless belts on the other of said return rollers at the contact surface therebetween.

4,082,600

FILM SPLICING APPARATUS

Rudolph Hanke, Monheim, Schwaben, Germany, assignor to Hamma Hamaphot KG., Hanke & Thomas, Monheim, Schwaben, Germany

Filed Jun. 20, 1977, Ser. No. 808,193
Claims priority, application Germany, Jul. 3, 1976, 2629985
Int. Cl.[2] B31F *5/00*
U.S. Cl. 156—505 **6 Claims**



1. Apparatus for splicing together the abutting ends of two films by means of an adhesive foil having a tearoff strip and which can be folded back on itself in hairpin configuration to provide two leaves overlying the abutting ends of said films from opposite sides thereof, which adhesive foil, prior to application to said film ends, being supported on removable carrier paper strips, said apparatus comprising a base having a level top surface in which is a depression, and a projection upstanding from the bottom of said depression, a flap connected to said base for swinging movement, about a pivot axis, between an initial position lying in said depression in said base with its upper surface flush with said top surface of said base and an inverted position displaced through an angle of about 180° about said pivot axis from said initial position, a window in said flap for entry therein of said projection when said flap is in its said initial position, a film guide on said flap, upwardly-projecting prongs on said flap for engagement thereof of said adhesive foil by corresponding holes in said foil at each end of its said tear-off strip, a pin carried by said flap, said pin extending substantially parallel to said pivot axis and traversing said window, a shoulder provided on said base so as to be disposed to the side of said pivot remote from said depression, a ledge disposed on said shoulder and defining, with a substantially upright side of said shoulder, an edge which extends substantially parallel to said pivot axis, said edge being spaced from said pivot axis by a distance (M) equal to the sum of the distance (N) between said pin and said pivot axis (which distance N corresponds approximately to half of the length of said tear-off strip) together with the thickness of said adhesive foil and a slight clearance, said shoulder having an upper surface which is coplanar with the bottom surface of said depression, and said upright side and ledge serving as a stop which, upon swinging said flap, with an adhesive foil positioned on its

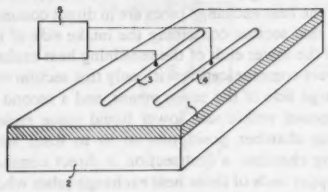
prongs, serve to cause erection of a free limb of said adhesive foil.

4,082,601

PROCESS FOR FABRICATING LI(NBTA)O_3 FILMS ONTO LITHIUM TANTALATE SINGLE CRYSTALS

Andre Maurice Regreny, Parc ar Croas, Rue Albert Camus; Michel Xavier Passaret, 20, Rue Pierre le Goffic, both of Perros Guirec, France (22700), and Loic Andre Rivoallan, Tossen Hat, Kermoroc'h, France (22140)

Filed Jan. 26, 1976, Ser. No. 652,392
Claims priority, application France, Feb. 11, 1975, 75 04768
Int. Cl.[2] B01J *17/04;* C01D *15/00*
U.S. Cl. 156—623 R 7 Claims



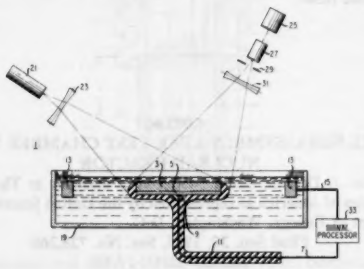
1. A process of manufacturing single crystal Li(NbTa)O_3 films on lithium tantalate single-crystals, wherein said film is grown in a pressure of about 1200 bars on the said lithium tantalate single-crystal by hydrothermal synthesis wherein the alkaline solution is heated to a temperature in the order of approximately 370° C. which is lower than the Curie point of lithium tantalate single-crystal, the mother material being a mixture of tantalum and niobium salts.

4,082,602

PHOTOVOLTAIC CELL MANUFACTURE

Kuang-Chou Chang, North Plainfield; Adam Heller, Bridgewater, and Barry Miller, Murray Hill, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 2, 1977, Ser. No. 792,580
Int. Cl.[2] H01L *21/306*
U.S. Cl. 156—627 13 Claims



1. A method for production line quality control of junction devices comprising:

selecting from time to time at least one of said junction devices;

irradiating said junction device with an intense first light source;

irradiating said junction device with a second light source; said second light source adaptable to produce light at at least one wavelength;

measuring the photovoltaic output from said junction device at at least one wavelength, said measured wavelength corresponding to said incident wavelength, said measured photovoltaic output being indicative of the presence of functional imperfections in said junction device;

comparing said measured photovoltaic output with the desired photovoltaic output; and

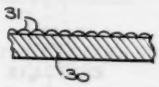
setting the processing parameters for said junction devices in accordance with said comparison.

4,082,603

ENVELOPE OPENING PROCESS

John B. McPherson, Old Lyme, and William H. Gunther, Jr., Guilford, Conn., assignors to Thor Dahl, Inc., New York, N.Y.

Filed Jul. 28, 1975, Ser. No. 599,596
Int. Cl.[2] B44C *1/22*
U.S. Cl. 156—654 1 Claim



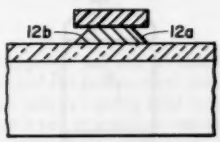
1. The process of opening an envelope which has been previously treated along three edges comprising continuously moving an edge of the envelope relative to a heating means and in contact therewith so that heat may be applied to the edge, rotating the envelope 90° so that one other edge of the envelope is placed in contact with and moved relative to the heat means, rotating the envelope another 90° so that a third edge is placed in contact with and is moved relative to the heat means, the envelope being moved relative to the heat means in batches with other similar envelopes loosely held so that the edges will drop on to the heating element and wherein a treating chemical is applied to the edges by moving the envelopes into contact with an encapsulating sheet having microscopic capsules, said encapsulated sheet being U-shaped in order to embrace three edges of the envelope, whereby the capsules therein are broken by pressure from the envelopes.

4,082,604

SEMICONDUCTOR PROCESS

Richard R. Yanez, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1976, Ser. No. 646,317
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—656 3 Claims



1. In a process for producing a semiconductor integrated circuit the steps comprising:

(a) depositing an aluminum metallization layer over an insulating layer of a semiconductor substrate,

(b) forming a conversion coating on the surface of the aluminum metallization layer by immersing the semiconductor substrate in fuming nitric acid and then subjecting the wafer to boiling water,

(c) selectively masking said aluminum metallization layer, and

(d) etching said aluminum metallization whereby said conversion coating etches more rapidly than the unconverted portion of the layer and forms a sloping etch on the unremoved aluminum layer.

4,082,605

PROCESSING PRINTED CIRCUIT BOARDS

Peter Kepets, Konigsberger Str. 2, D-6343 Frohnhausen, Germany

Filed Nov. 3, 1975, Ser. No. 628,532
Claims priority, application Germany, Nov. 19, 1974, 2454709
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—656 **21 Claims**

1. In a process for treating a circuit board with a liquid treating solution, the improvement which comprises the steps of:

(a) placing a liquid treating solution for a circuit board into a transparent, flexible container having an opening;

(b) inserting the circuit board into the container through the opening;

(c) sealing the container by temporarily closing the opening of the container; and

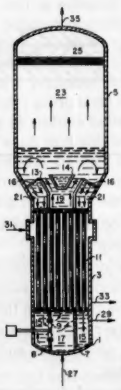
(d) contacting the circuit board with the liquid treating solution while the opening is temporarily closed.

4,082,606

EVAPORATION APPARATUS

James E. Houston, Grand Island, N.Y.; Reynard W. Gingrich, Fort Erie, Canada, and Earl A. Schilt, Kenmore, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 429,999, Jan. 2, 1974, abandoned. This application Oct. 20, 1975, Ser. No. 624,139
The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.
Int. Cl.[2] B01D *1/06*
U.S. Cl. 159—27 B **5 Claims**



1. An integral forced circulation evaporation apparatus which comprises an evaporating chamber having a lower liquid space region containing heated liquid and an upper vapor space region containing vapors flashed off from the heated liquid in the lower liquid space region, a heating zone containing vertically disposed heat exchange tubes, and a liquid receiving chamber, said lower liquid space region of the evaporating chamber being surmounted on said heating zone in direct communication with the upper ends of each of said heat exchange tubes, said liquid receiving chamber being surmounted by said heating zone in direct communication with the lower ends of said heat exchange tubes; pump means disposed within said liquid receiving chamber for the circulation of liquid through said evaporator apparatus, partition means disposed wihin said liquid receiving chamber so as to form, within said liquid receiving chamber, a first section containing the intake side of said pump means and a second section containing the discharge side of said pump means, said partition means further being positioned such that the lower ends of a portion of the heat exchange tubes are in direct communication with only that section containing the intake side of the pump means and the lower ends of the remaining heat exchange tube having direct communication with only that section containing the discharge side of the pump means, and a second partition means disposed within said lower liquid space region of the evaporating chamber positioned so as to form within said evaporating chamber, a first section in direct communication with the upper ends of those heat exchange tubes whose lower ends are in direct communication with the intake side of the pump means and a second section in direct communication with the upper ends of those heat exchange tubes whose lower ends are in direct communication with the discharge side of the pump means, said second partition means being formed so as to prevent liquid flow between said sections in the evaporating chamber at a point immediately adjacent the upper ends of said heat exchange tubes while permitting liquid flow between said sections in the evaporating chamber at a point above the upper end of said second partition means, and further being positioned so that it is below the level of the liquid in the lower liquid space region of the evaporating chamber, said second partition means being substantially funnel shaped and disposed in the lower liquid space region of said evaporating chamber and positioned in the central part thereof so as to form a central, inner section, and an outer section surrounding said inner section, and a conically shaped member disposed within the upper portion of said second partition means, and spaced apart therefrom, so as to form an annular channel for the distribution of liquid flow.

4,082,607

FUEL SUBASSEMBLY LEAK TEST CHAMBER FOR A NUCLEAR REACTOR

Charles J. Divona, Santa Ana, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 30, 1976, Ser. No. 728,360
Int. Cl.[2] G21C *17/00*
U.S. Cl. 176—19 LD **4 Claims**

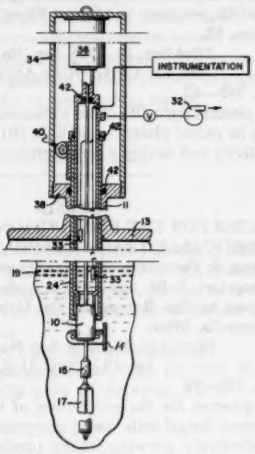
1. A test chamber for isolating fuel subassemblies inside the primary tank of a nuclear reactor to detect leakage of fission products therefrom comprising:

a cylindrical container pipe having an open end, means for drawing a vacuum in the pipe and means for sealably extending a gripper through the container pipe,

an actuator pipe surrounding the container pipe and slidable thereon, the surface of the container pipe acting as a bearing for the actuator pipe, said actuator pipe being small enough in diameter to be inserted into the primary tank through a pipe nozzle in the cover thereof,

a shutter valve consisting of a circular disc for sealing the open end of the container pipe, and

means connected to said actuator pipe and operable thereby for operating the shutter valve to allow the gripper to lift



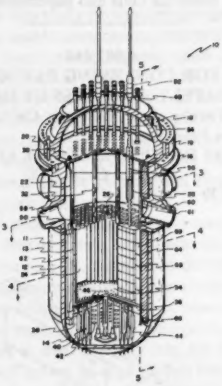
a fuel assembly into the container pipe and to seal the container pipe.

4,082,608

COOLING OF PRESSURIZED WATER NUCLEAR REACTOR VESSELS

Harvey Donald Curet, Idaho Falls, Id., assignor to Energy, Inc., Idaho Falls, Id.

Filed Oct. 14, 1976, Ser. No. 732,254
Int. Cl.[2] G21C *15/00*
U.S. Cl. 176—61 **3 Claims**



1. A pressurized water nuclear reactor vessel comprising:

a generally cylindrical outer shell having closed ends, core coolant means being disposed adjacent one of said ends, said core coolant means being constructed and arranged to cause coolant to flow from adjacent second end into the reactor core,

a generally cylindrical core barrel being of lesser diameter than the shell and being disposed centrally to the outer shell thereby forming an annular space between the barrel and the outer shell, said barrel carrying a plurality of core rod assemblies internal thereto.

a plurality of coolant inlets carried by the shell and communicating coolant to an influent portion of the annular space, and

a plurality of coolant outlets communicating coolant between the core coolant means of the core barrel and the exterior of the shell,

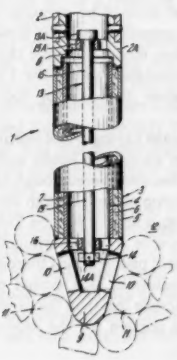
structure to prevent core over heating during a loss of coolant accident comprising a plurality of generally parallel channels substantially arcuate in cross section, substantially equally sized and shaped and contiguous one with the next, said channels essentially filling said annular space, each channel extending longitudinally the full distance between said influent portion and the core coolant means at one end of the outer shell thereby substantially dividing the coolant into equal volumes of flow and directing each to the core barrel, the cross-sectional area of each channel being substantially constant throughout its length and means physically separating all structure in which coolant flows into the core barrel from all structure in which coolant flows from the core barrel.

4,082,609

CONTROL ROD FOR GAS-COOLED NUCLEAR REACTORS

Fritz Schweiger, Hagen, Germany, assignor to Hochtemperatur-Kernkraftwerk GmbH, Gemeinsames Europaisches Unternehmen, Uentrop, Unna, Germany

Continuation-in-part of Ser. No. 592,882, Jul. 3, 1975, abandoned, which is a continuation of Ser. No. 517,630, Oct. 24, 1974, abandoned, which is a continuation of Ser. No. 391,022, Aug. 23, 1973, abandoned, which is a continuation of Ser. No. 233,052, Mar. 13, 1972, abandoned. This application Apr. 28, 1976, Ser. No. 680,924
Claims priority, application Germany, Mar. 16, 1971, 2112471
Int. Cl.[2] G21C *7/10*
U.S. Cl. 176—86 R **8 Claims**



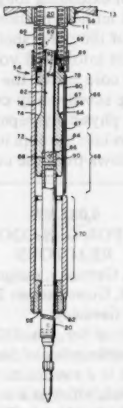
1. In a gas-cooled pebble bed nuclear reactor, wherein the poison part of a control rod having upper and lower end portions and having an interior cooling fluid channel is movable into and away from a bed of spherical fuel elements, the improvement which comprises a control rod security device which, upon fracture of said control rod intermediate its end portions facilitates removal of the fractured control rod from said reactor, said security device including an oblong member located and extending within said channel and being slack relative to said control rod, said oblong member having opposite ends, first means attached to said one of said opposite ends for preventing a fall of said oblong member into said lower portion, second means attached to the other of said opposite ends for preventing portions of said control rod from falling into said bed of fuel elements upon fracture of said control rod intermediate said end portions, said oblong member being sufficiently strong so as to hold said upper and lower end portions together upon fracture of said control rod whereby, upon fracture of said control rod intermediate its upper and lower portions, said upper and lower end portions remain interconnected through said security device.

4,082,610

SNUBBER ASSEMBLY FOR A CONTROL ROD DRIVE

John C. Matthews, Lancaster, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio

Filed May 16, 1975, Ser. No. 578,437
Int. Cl.[2] G21C *7/08, 9/00;* F16F *9/18*
U.S. Cl. 176—365 10 Claims



1. A three-portion snubber assembly for decelerating a control rod dropping into a Liquid Filled nuclear reactor comprising:

piston means mounted proximate to an end of a leadscrew of the control rod drive to be movable with the leadscrew;

enclosure means extending partially around the leadscrew to allow said piston means to move therein, said enclosure means being locatable within the Liquid Filled nuclear reactor whenever the control rod drive is mounted thereto; and

said enclosure means having a first portion providing a series of openings to allow any liquid within the control rod drive to be exhausted therethrough in response to movement of said piston means through the first portion of said enclosure means, a second portion formed next to said first portion to provide a predetermined clearance for the movement of said piston means therein and a third portion formed proximately to said second portion to provide a decreased clearance less than the predetermined clearance of said second portion for the movement of said piston means therein.

4,082,611

CONTINUOUS FERMENTATION PROCESS

Neil Trevor Cotton, St. Agnes near Truro, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 30, 1976, Ser. No. 746,015
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—28 R 9 Claims

1. A fermentation process for continuously culturing micro-organisms in a culture medium containing a source of assimilable carbon and inorganic nutrients which comprises the steps of continuously withdrawing a proportion of the culture from the main body thereof, treating the withdrawn culture to kill microorganisms present therein and returning the treated culture to the main body of the culture, the proportion of the microorganisms killed being such that, when the fermentation is proceeding in its steady state, 20 to 70% of the microorganisms present in the main body of the culture are dead.

4,082,612

PLASMINOGEN ACTIVATOR COMPLEX

Kenneth C. Robbins, Chicago, and Louis Summaria, Villa Park, both of Ill., assignors to Michael Reese Research Foundation, Chicago, Ill.

Filed Sep. 24, 1976, Ser. No. 726,142
Int. Cl.[2] C07G *7/026;* A61K *37/48*
U.S. Cl. 195—62 32 Claims

1. A plasmin light (B) chain separated from the heavy (A) chain in its parent plasmin, said light (B) chain having proteolytic activity and having a serine protease active site.

4,082,613

PROCESS FOR THE PRODUCTION OF INSULIN BY GENETICALLY TRANSFORMED FUNGAL CELLS

Mandayam J. Thirumalachar; Mandayam J. Narasimhan, both of Bangalore, India, and John A. Anderson, St. Paul, Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 23, 1976, Ser. No. 679,565
Int. Cl.[2] C12D *13/02*
U.S. Cl. 195—76 6 Claims

1. A process for the production of insulin by genetically transformed fungal cells which comprises:

A. selectively growing insulin producing beta-epithelioid cells from a pancreas and serially sub-culturing the cells under aerated cell growth conditions in a nutrient amino acid-rich medium,

B. inoculating the rapid growth fungus Pseudosaccharomycete TC-1176 with genomic material extracted from the sub-culture cells and incubating in the presence of an anti-fungal membrane permeability agent to incorporate the functional genome into the fungal cell structure,

C. incubating the resultant bio-transformed fungal cells in a carbohydrate-nitrogen-rich medium under cell growth conditions, and

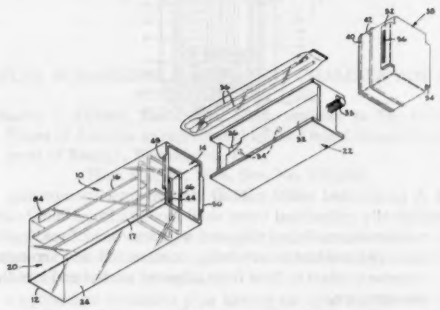
D. separating the fungal cells from the media and extracting the insulin from the cells and supernatant media.

4,082,614

MEANS FOR CONVEYING PATHOLOGICAL SPECIMENS SAFELY TO PLACES OF IDENTIFICATION

Donald H. DeVaughn, San Francisco, Calif., assignor to Bio-Syn, Inc., San Francisco, Calif.

Filed Dec. 10, 1975, Ser. No. 639,156
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—139 4 Claims



1. A portable culturing device for both obligate and facultative micro-organisms comprising an elongated enclosure of transparent heat resistant material having an open end; partitioning means dividing said enclosure into two vertically aligned compartments one of which contains a tool for transferring specimens; a carrier structure having a flat area containing layers of nutrient slidably received in the other one of said compartments through the open end of said enclosure, said

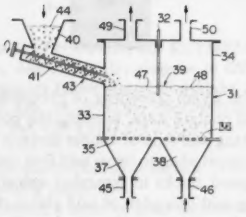
carrier structure being of H-shaped cross-sectional contour with the upper and lower areas of the cross bar of the H forming culturing areas and with all opposed edges in slidable contact with the walls of said second compartment; closure means adapted to hermetically seal said enclosure; and means within said closure means operable to bind free oxygen within said enclosure and to generate carbon dioxide to replace the oxygen removed by the oxygen binding means.

4,082,615

THERMAL DECOMPOSITION PROCESS AND APPARATUS FOR ORGANIC SOLID MATERIALS

Takeo Komuro; Yukio Saito, and Mizuno Hirato, all of Hitachi, Japan, assignors to The Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 12, 1976, Ser. No. 666,357
Claims priority, application Japan, Mar. 13, 1975, 50-29584
Int. Cl.² C10B *9/00, 49/10, 49/22, 53/02*
U.S. Cl. 201—12 **4 Claims**



1. A method for thermally decomposing organic solid materials for extracting usable components, comprising the steps of:

delivering the unprocessed organic solid material into a thermal decomposition zone;

fluidizing the organic solid material in the decomposition zone with a basically nonoxidizing gas;

heating the fluidized organic solid material within the decomposition zone to a temperature at least sufficient to thermally extract usable gaseous and liquid components from said organic solid material;

transferring the thus thermally decomposed organic solids while in the fluidized state to a combustion zone;

fluidizing and burning the transferred decomposed organic solids with oxidizing gas within the combustion zone;

maintaining said decomposition and combustion zones laterally adjacent each other and separated by a partition which extends at least partially into the fluidized bed of both zones and leaves an area of free fluidized bed communication between both zones beneath the lower end of said partition to permit said step of transferring and further the transfer of heat of combustion from the combustion zone to the decomposition zone as a part of said step of heating;

removing the product gases from the thermal decomposition zone separately from the gases in the combustion zone; and

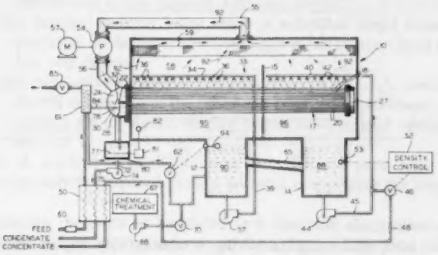
controlling the temperature within the thermal decomposition zone by adjusting the extent that the partition extends into the fluidized beds between the zones to correspondingly adjust the area of free fluidized communication between the zones and corrrespondingly adjust the quantity of solid material that will transfer from the thermal decomposition zone to the combustion zone for combustion.

4,082,616

VAPOR COMPRESSION DISTILLER

Arthur P. Antony, Shorewood, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Jul. 23, 1975, Ser. No. 598,407
Int. Cl.² B01D *3/42*
U.S. Cl. 203—3 **15 Claims**



1. A method of concentrating liquids comprising the steps of delivering a liquid to be concentrated to a first liquid circulating system and mixing the same with a partially concentrated liquid therein for providing a first liquid mixture,

contacting a first outer surface area of a plurality of a heat exchange tubes with said first liquid mixture,

delivering a portion of said first liquid mixture to a second liquid circulating system containing a second mixture of said liquid which is more heavily concentrated than the first liquid mixture,

delivering said second liquid mixture to a different surface area of said heat exchange tubes,

passing compressed vapor uninterruptedly through the interior of said heat exchange tubes and in heat exchange relation with interior surfaces of said tubes corresponding to the first and different surface areas thereof for condensing said vapor and for simulaneously evaporating at least a portion of said first and second liquid mixtures as the same contacts said first and different surface areas of said heat exchange tubes,

separately collecting the unevaporated portions of said first liquid mixture in a first container of said first liquid circulating system and said second liquid mixture in a second liquid container of said second liquid circulating system,

collecting the evaporated portions of said first and second liquid mixtures and compressing the same for delivery to the interiors of said heat exchange tubes.

4,082,617

RECOVERY OF CHEMICAL COMPONENTS OF CELLULOSIC REGENERATING SOLUTION

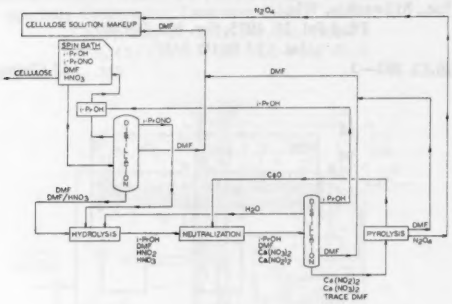
Norman A. Portnoy, Hopatcong, N.J., and David Paul Anderson, Amherst, Mass., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,422
Int. Cl.² B01D *3/34;* **C08B** *5/04, 5/12*
U.S. Cl. 203—28 **11 Claims**

1. A process for the separation and recovery of the alcoholic component of a cellulosic regenerating solution containing a lower dialkylacylamide solvent, a lower aliphatic monohydric alcohol selected from the group consisting of methanol, ethanol, propanol and isopropanol, a corresponding nitrite of said alcohol and nitric acid, said process comprising

distilling the solution to separate the alcohol therefrom, said

distillation occurring in the presence of a chemical complex between said dialkylacylamide solvent and said nitric



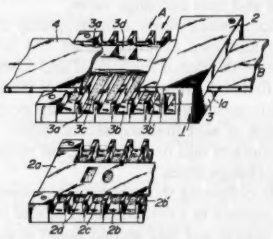
acid, said complex having a substantially higher boiling point than said alcohol or said nitrite of said alcohol, and recovering the alcohol from said distillation.

4,082,618

METHOD FOR ELECTROLYTIC TREATMENT

Kiyoto Furuya, Yokohama, Japan, assignor to Daiichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 596,184, Jul. 15, 1975, Pat. No. 4,014,773. This application Nov. 26, 1976, Ser. No. 745,365
Claims priority, application Japan, Jul. 31, 1974, 49-86911
Int. Cl.[2] C25D *5/02, 7/06*
U.S. Cl. 204—15 **7 Claims**



1. A method of electrolytic treating elongated materials such as hoop materials, rods and wires comprising:

providing at least one insulating shield for shielding portions not to be treated of at least one material simultaneously to be treated,

supplying a treating liquid to be confined in at least one flow path with a supplying direction transversely of a direction of feeding said material and substantially in a plane including said material whereby said treating liquid flows transversely past substantially an entire surface of said material,

causing electric current to flow through said confined liquid in said flow path to said unshielded material, and

feeding said material past said flow path.

4,082,619

METHOD OF FORMING A COMB-LIKE ELECTRODE STRUCTURE

Heinz Dehnert, Am Bahnhof, D-7801 Hugstetten-March, Germany

Filed Dec. 29, 1976, Ser. No. 755,291
Claims priority, application Germany, Jan. 7, 1976, 2600340
Int. Cl.[2] C25D *5/02, 5/12, 7/06*
U.S. Cl. 204—15 **2 Claims**

1. The method of fabricating a recording instrument of the type comprising a comb-like electrode arrangement having individual electrodes which can be driven independently to effect a current flow between each individual electrode and a counter electrode to produce a mark on a record medium moving under the electrode arrangement, said method comprising the steps of fabricating a planar platen by photochemically processing a copper foil layer on a non-conductive support plate to provide a conductive pattern of copper on said support plate consisting of a comb-like region of generally parallel, spaced, closely adjacent elongated copper tracks having corresponding first ends thereof interconnected to one another adjacent one edge of said support plate by a strip of copper extending transverse to the directions of elongation of said tracks, thereafter electrolytically coating said comb-like region of said copper pattern with a layer of nickel, thereafter electrolytically coating said nickel layer with a further layer of

metal from the group consisting of chromium and iron, and, following said coating steps, severing the portion of said support plate having said strip of copper thereon from the remainder of said support plate to leave said first corresponding ends of said elongated tracks in separated spaced relation to one another along said one edge of said platen, beveling the rear side of said platen along said one edge of said platen into a wedge shape, removably placing said platen in a mounting structure with said beveled edge of said platen being positioned in line contact with a coated paper record medium the plane of which is disposed at an angle of between 20° and 30° to the plane of said platen, and positioning a soft rubber roller below the line of contact between said record medium and said platen to resiliently urge said record medium into forcible engagement with the beveled edge of said platen.

4,082,620

PROCESS FOR CHROMATING METALLIC SURFACES

Peter Kenny Skurkiss, Short Hills, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 29, 1977, Ser. No. 792,246
Int. Cl.[2] C25D *5/02, 11/00, 11/38*
U.S. Cl. 204—15 **18 Claims**

1. A process for electrolytically producing a layer on a metallic surface said layer consisting essentially of at least 90 percent chromium and oxygen chemically combined together, including the step of passing electrical current through an anode, aqueous solution and cathode said aqueous solution comprising chromium-containing ions capable of yielding said layer on electrolysis in which the metal surface comprises at least 50 percent by weight of at least one metal selected from the group consisting of copper, nickel, and iron CHARACTERIZED IN THAT the pH of the solution is less than 7 and the solution contains ammonium ions in the concentration range from 0.005 molar to saturation and the layer is used as a mask in an electroplating process involving the plating of a metal selected from the group consisting of gold, copper, nickel and solder.

4,082,621

PLATING METHOD WITH LEAD OR TIN SUBLAYER

Nicholas J. Spiliotis, Parsippany, N.J.; William R. Schevey, Honesdale, and Donald W. Himler, Easton, both of Pa., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 3, 1977, Ser. No. 756,158
Int. Cl.[2] C25D 5/12, 5/56
U.S. Cl. 204—38 B 13 Claims

1. A method of forming an electroplated article from a substrate, said substrate being a non-conductive plastic, comprising the steps:

(a) depositing a thin film of conductive metal on said non-conductive plastic to form a metal surface;

(b) electrolytically plating on said metal surface a metal sublayer having predominantly a metal selected from the group consisting of lead, tin and mixtures thereof on said surface from an electrolytic bath containing lead cations, tin cations or both;

(c) electrolytically plating a second layer having predominantly a metal selected from the group consisting of nickel, cobalt and mixtures thereof directly onto said metal sublayer from an electrolytic bath containing nickel fluoborate, cobalt fluoborate or both; and

(d) electrolytically plating chromium onto said second layer.

4,082,622

ELECTRODEPOSITION OF RUTHENIUM

Bodo G. Gebauer, Algonquin, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 20, 1977, Ser. No. 789,176
Int. Cl.[2] C25D 5/10, 7/00
U.S. Cl. 204—40 4 Claims

1. A process for electroplating a surface of a metal article with ruthenium which comprises:

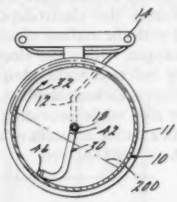
pulse current plating a layer of gold on the surface of said metal article, and electroplating a ruthenium layer on said gold layer.

4,082,623

METHOD OF ELECTROPLATING SMALL PARTS WITH CHROME SUBSTITUTE TIN ALLOYS AND ELECTROPLATING BARREL THEREFOR

Alan Jon Musbach, Rochester, Mich., assignor to M.C.P. Industries, Inc., Troy, Mich.

Filed Aug. 26, 1976, Ser. No. 717,985
Int. Cl.[2] C25D 3/56, 3/60, 17/20
U.S. Cl. 204—43 S 10 Claims



1. An electroplating means for applying a chrome substitute metal plating, comprising,

a rotatable electroplating barrel with an entry-exit door disposed therein,

support means for supporting the barrel and for raising and lowering it in and out of a chrome substitute plating solution, selected from at least one of the group consisting of a tin-cobalt plating solution, a tin-nickel-cobalt plating solution, or a tin-nickel plating solution,

a special cathode dangler assembly within said barrel and including,

a central bar member which generally runs the length of the barrel and which is generally fixed and non-rotatable during plating,

at least three dangler members attached to and depending radially downwardly from said central bar, with said dangler members being of a length sufficient to contact and partially overlay the inner surface of said barrel and being generally flexed in a direction in which the barrel rotates due to the contact with said barrel,

said dangler member being made of a flexible metal strand electrical cable material which has a metal contact head at one end thereof,

said metal strand material being sheathed in a flexible plastic sheath member, and the other end of said dangler member being a fitting means readily connectable to said central bar.

6. A method of manufacturing electroplated parts with a chrome substitute metal plating thereon, comprising the steps of:

placing the parts to be plated in a rotatable electroplating barrel through an entry-exit door disposed therein, said barrel including a central bar member which generally runs the length of the barrel and which is generally fixed and non-rotatable during plating, at least three dangler members attached to and depending radially downwardly from said central bar, with said dangler members being of a length sufficient to contact and partially overlay the inner surface of said barrel and being generally flexed in a direction in which the barrel rotates due to the contact with said barrel, said dangler member being made of a flexible metal strand electrical cable material which has a corrosion resistant metal contact head at one end thereof which is submersed in the parts being plated, said metal strand material being sheathed in a flexible plastic sheath member, and the other end of said dangler member being a fitting means readily connectable to said central bar,

submerging said barrel in a chrome substitute plating solution selected from at least one of the group consisting of a tin-cobalt plating solution, a tin-nickel-cobalt plating solution, or a tin-nickel plating solution, to thereby complete an electrical circuit for carrying out the electroplating,

rotating said barrel during said electroplating in a direction of rotation which will maintain said dangler members at optimum immersion in said parts being plated,

said submerging being carried out for a time period of between about ½ and about 25 minutes, and

with a plating current being applied during said submerging of between about ½ and about 60 amperes per square foot.

removing the barrel from the plating solution and rinsing the parts.

4,082,624

ARTICLES ELECTRODEPOSITED WITH RUTHENIUM AND PROCESSES OF PRODUCING SUCH ARTICLES

Adam Heller, Bridgewater; Barry Miller, Murray Hill, and Richard George Vadimsky, Somerville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 3, 1976, Ser. No. 747,239
Int. Cl.[2] C25D 3/50; C01B 9/02
U.S. Cl. 204—47 11 Claims

1. An article electrodeposited with ruthenium from an aqueous plating solution of the ruthenium compound $K_3[Ru_2N(H_2O)_2Cl_8]$ of the composition and structure resulting from the method comprising refluxing an aqueous solution of ruthenium chloride and NH_2SO_3H said mixture having approximately 0.5 moles of sulphamic acid for each mole of ruthenium and precipitating said compound by adding KCl and HCl to said mixture.

4. A process of preparing a solution of $K_3[Ru_2N(H_2O)_2Cl_8]$ for the electrodeposition of ruthenium comprising the steps of refluxing a mixture of hydrated ruthenium chloride and NH_2SO_3H, said mixture having approximately 0.5 moles of

sulphamic acid for each mole of ruthenium and precipitating said $K_3[Ru_2N(H_2O)_2Cl_8]$ by adding KCl and HCl to said mixture.

5. A method of electrodepositing an article with ruthenium comprising the steps of placing an aqueous solution of the compound prepared by the process of claim 4 into electroplating apparatus, said apparatus having anode and cathode compartments, and cathodically depositing ruthenium on said article.

4,082,625
ELECTRODEPOSITION OF RUTHENIUM

Jeffrey Norman Crosby, Kidderminster, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jun. 1, 1977, Ser. No. 802,437

Claims priority, application United Kingdom, Jun. 8, 1976, 23653/76

Int. Cl.² C25D *3/50*

U.S. Cl. 204—47 **21 Claims**

13. A bath for the electrodeposition of ruthenium comprising an aqueous solution of a ruthenium compound in which the ruthenium is present in a cationic complex of the formula

$$[Ru_2N(NH_3)_8X_2]^{3+}$$

where X is chlorine, bromine or iodine.

4,082,626
PROCESS FOR FORMING A SILICATE COATING ON METAL

Rudolf Hradcovsky, 27 W. Beach St., Long Beach, Long Island, N.Y. 11561

Filed Dec. 17, 1976, Ser. No. 751,252

Int. Cl.² C25D *11/02, 11/06, 11/34*

U.S. Cl. 204—56 R **28 Claims**

1. A method of coating a rectifier metal selected from the group consisting of aluminum, tantalium, niobium and alloys thereof, and alloys of aluminum with copper and zinc, to produce a hard, glassy, adherent and corrosion-resistant layer, comprising: (a) immersing said metal in an electrolyte bath consisting essentially of concentrated aqueous solution of potassium silicate,

(b) immersing a metal which is cathodic with respect to said rectifier metal in said bath,

(c) causing electric current to flow between said rectifier metal and said cathode until a visible spark is discharged at the surface of said rectifier metal, and

(d) increasing the voltage potential between said rectifier metal and said cathode to about 300 volts and maintaining said voltage at about 300 volts until the desired layer thickness is deposited on said rectifier metal.

4,082,627
ELECTROLYTIC REDUCTION OF DIHYDROBENZOPYRANOXANTHENONES

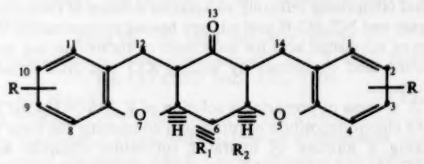
David A. Hall, Indianapolis, and Richard E. Heiney, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 26, 1977, Ser. No. 800,674

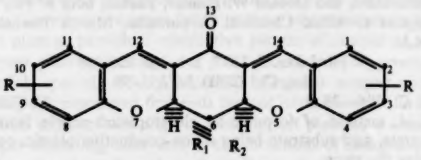
Int. Cl.² C25B *3/04*

U.S. Cl. 204—59 R **14 Claims**

1. A process for preparing a compound of the formula



which comprises electrolytically reducing a compound of the formula



in which, in any of the above, each R is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, cyano, or halo, and both R groups are identical and are symmetrically located; R_1 is C_1–C_3 alkyl and R_2 is methyl, or R_1 and R_2 taken together are $—(CH_2)_n$ in which n is an integer from 4 to 6; such electrolytic reduction being carried out at a temperature of from about 5° C. to about 80° C. in an organic or an aqueous-organic medium at a mercury cathode in the presence of a proton source having pKa values of from about 2 to about 6 and in the presence of an electrolyte selected from the group consisting of alkali metal salts, quaternary ammonium salts having a total of about 10 to about 28 carbon atoms in the cation moiety, and tertiary amine salts having a total of about 7 to about 21 carbon atoms in the cation moiety.

4,082,628
METHOD OF ADJUSTING THE HARDNESS OF A TITANIUM METAL

Shin-ichi Tokumoto; Eiji Tanaka, both of Yokohama; Tatsuo Kikuchi, Hoya; Kenji Ogisu, Yokohama, and Toshiro Tsumori, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 26, 1976, Ser. No. 690,058

Claims priority, application Japan, May 27, 1975, 50-63738

Int. Cl.² C25C *3/28*

U.S. Cl. 204—64 T **8 Claims**

1. In the method of electrodepositing a substantially flat deposit of titanium metal onto a cathode from a fused salt electrolyte containing titanium chloride and at least one chloride salt of alkaline and alkaline-earth metals; the improvement of increasing the hardness of the electrodeposited titanium metal by dissolving in said fused salt electrolyte about 0.07 wt.%, based on the balance of the electrolyte, of at least titanium oxide from the group consisting of titanium oxide and oxides of alkaline and alkaline-earth metals, and adding to the fused electrolyte about 1.12 wt.% of potassium fluoride for increasing the solubility of each said oxide in the fused electrolyte so that, during the electrodeposition, the dissolved oxide is contacted with the surface of said cathode for distributing interstitial oxygen within the electrodeposited titanium metal and thereby increasing the hardness of the latter, as measured by the micro Vicker's method, to the range of from bout 140 to about 200, while providing the electrodeposited titanium metal with a lattice constant of about $a=2.9505$A and about C=4.6853A to 4.6887A.

4,082,629
HYDROMETALLURGICAL PROCESS FOR TREATING METAL SULFIDES CONTAINING LEAD SULFIDE

Edward F. G. Milner, Warfield; Ernest G. Parker, and Godefridus M. Swinkels, both of Rossland, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Feb. 28, 1977, Ser. No. 772,630

Int. Cl.² C25C *3/34;* C22B *1/02, 11/04*

U.S. Cl. 204—66 **22 Claims**

1. A process for the treatment of complex lead sulfide-containing concentrates additionally containing at least one metal of the group consisting of iron, copper, zinc, silver, arsenic, antimony, bismuth and gold which comprises the steps of:

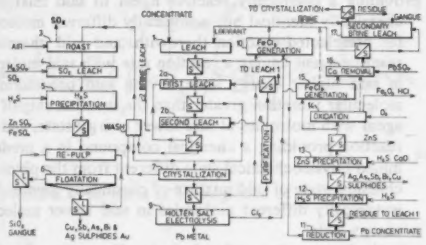
(1) selectively leaching concentrate with an iron-containing

lixiviant for converting lead sulfide in said concentrate to lead chloride to produce a leach residue and a leach solution;

(2) subjecting said leach residue to a two-stage, countercurrent, hot brine leach to dissolve lead chloride in a brine-leach solution and to form a brine-leach residue;

(3) subjecting the brine-leach solution to crystallization by evaporative cooling to lower the temperature of the said solution to the range of 20° to 30° C. for the separate recovery of crystallized lead chloride, residual brine and crystallization condensate, and returning said residual brine to the brine leach of step (2);

(4) subjecting crystallized lead chloride in admixture with about 8% by weight of sodium chloride to electrolysis in



a fused bath at a temperature in the range of 410° to 500° C. for production of lead and evolution of chlorine;

(5) sequentially washing the brine-leach residue from step (2) in two or more stages with crystallization condensate to remove lead chloride from said residue, returning condensate from said washing stages to step (3) and recovering said washed residue;

(6) dividing leach solution from step (1) into two or more portions;

(7) absorbing chlorine in a first portion of the leach solution from step (1) for the generation of ferric chloride-containing solution; and

(8) treating a second portion of leach solution for the recovery of contained values.

4,082,630

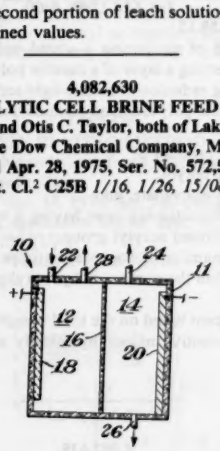
ELECTROLYTIC CELL BRINE FEED SYSTEM

A. C. Wiley, Jr., and Otis C. Taylor, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 28, 1975, Ser. No. 572,542

Int. Cl.² C25B 1/16, 1/26, 15/08

U.S. Cl. 205—98 **10 Claims**



1. In a process to produce chlorine and an alkali metal hydroxide in an electrolytic diaphragm cell system by feeding an alkali metal chloride containing brine to an anode compartment and passing alkali metal ions through the diaphragm into a cathode chamber, supplying sufficient electrical energy to an anode positioned in the anode compartment and to a cathode positioned in the cathode compartment to release gaseous chlorine at the anode and form an alkali metal hydroxide in the cathode compartment, and recovering the chlorine and alkali metal hydroxide, the improvement comprising suitably adjusting the lengths of secondary conduits connected to the anode compartment to feed a substantially uniform volume of an aqueous slurry containing an alkali metal particulate through each of the secondary conduits in a unit time period; feeding the slurry through at least one primary conduit and then through the secondary conduits into the anode compartment, the secondary conduits having an interior cross-sectional area of up to about 0.2 square inch and less than the interior cross-sectional area of the primary conduit; and controlling the flow of the slurry through the primary and the secondary conduits at a linear velocity of at least about 6.5 feet per second.

4,082,631

ABSORPTION OF CHLORINE GAS

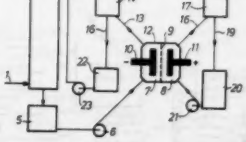
Eberhard Zirngiebl, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 17, 1976, Ser. No. 724,121

Claims priority, application Germany, Oct. 9, 1975, 2545342

Int. Cl.² C25B 1/26

U.S. Cl. 204—128 **6 Claims**



1. A process for the absorption of chlorine from a chlorine-containing gas, comprising contacting the chlorine-containing gas with an aqueous solution containing about 1 to 400 g/l of iron(II)chloride and about 0.1 to 10 g/l of a salt of at least one of copper(I) and copper(II), the chlorine being absorbed by conversion to chloride ion and with conversion of the iron(II)-chloride into iron(III)chloride, thereafter electrolyzing the iron(III)chloride to form chlorine and iron(II)chloride and recycling the iron(II)chloride for the absorption of additional chlorine.

4,082,632

PRODUCTION OF PERFORATED METAL FOIL

John Edward Whittle, Sutton Coldfield, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation of Ser. No. 715,534, Aug. 18, 1976, abandoned. This application Apr. 21, 1977, Ser. No. 789,689

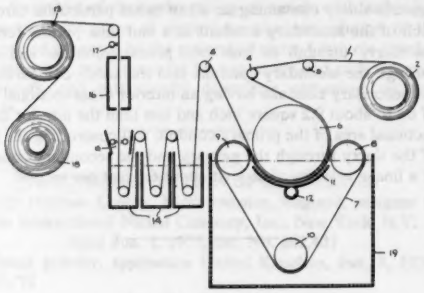
Claims priority, application United Kingdom, Aug. 26, 1975, 35178/75

Int. Cl.² C25F 3/14, 3/02

U.S. Cl. 204—129.65 **7 Claims**

1. A process for the production of a continuous length of perforated metal foil comprising passing a continuous length of foil through an electrolytic etching bath wherein one face of the foil contacts a surface which is inert with respect to the electrolyte and the other face of the foil is in contact with an endless perforated titanium mask simultaneously moving together with the foil while in the bath, and applying a potential

difference of up to 10 volts across the foil and a cathode immersed in the bath, whereby the portions of the foil exposed to



the bath through the perforated mask are anodically etched away.

4,082,633

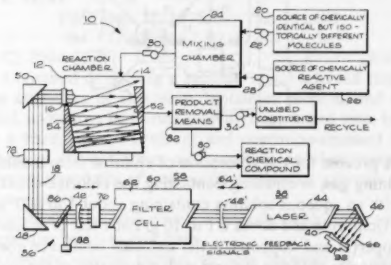
HIGH MASS ISOTOPE SEPARATION PROCESS AND ARRANGEMENT

Jozef Willem Eerkens, 1342 Lachman La., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 262,661, Jun. 14, 1972. This application Dec. 11, 1975, Ser. No. 639,977

Int. Cl.[2] B01J *1/10*; B01K *1/00*

U.S. Cl. 204—157.1 R **72 Claims**



1. In a process for obtaining a predetermined isotope by separating predetermined isotopic molecules of the predetermined isotope from a mixture of chemically identical but isotopically different molecules, to obtain an enhanced concentration of the predetermined isotopic molecules, and wherein the molecules comprising the mixture of chemically identical but isotopically different molecules have photon-inducible transitions between a lower molecular energy state of rovibrational levels and a higher molecular energy state of rovibrational levels, thereby defining a rovibrational photon absorption band, and wherein said molecules of said higher molecular energy state have a predetermined molecular vibration, and wherein said absorption band of the chemically identical but isotopically different molecules containing the predetermined isotope are frequency-shifted with respect to the absorption band of the other chemically identical but isotopically different molecules, and said absorption band having predetermined regions wherein the absorption cross-section of said predetermined isotopic molecules is larger than the absorption cross-section of the other isotopic molecules at a predetermined frequency within said predetermined region, the improvement comprising the steps of:

generating a beam of photons having a frequency corresponding to said predetermined frequency;

maintaining the mixture of chemically identical but isotopically different molecules at a predetermined pressure and a predetermined temperature;

irradiating the mixture of chemically identical but isotopically different molecules with said photons at said predetermined frequency to cause transitions of said chemically identical but isotopically different molecules to said higher molecular energy state, and said photons having a flux density to provide a rate of said transitions greater than the collisional de-excitation rate of the predetermined molecular vibration, thereby providing a population of molecules having said predetermined molecular vibration of said higher molecular energy state greater than the population of said molecules having said predetermined molecular vibration of said lower molecular energy state;

providing a chemically reactive agent to said mixture of chemically identical but isotopically different molecules, for preselected reaction therewith, and said chemically reactive agent having a reaction rate with said molecules in said higher energy state having said predetermined molecular vibration greater than the reaction rate of said agent with molecules at said lower energy state, and said reaction providing a chemical compound in a predetermined physicochemical state different from the physiocochemical state of said mixture of chemically identical but isotopically different molecules in said lower molecular energy state;

selectively removing said chemical compound; and

selectively recovering said predetermined isotope.

4,082,634

METHOD OF CURING B-STAGE POLYURETHANES

Wen-Hsuan Chang, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 141,434, May 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 746,740, Jul. 23, 1968, abandoned. This application Nov. 14, 1972, Ser. No. 307,270

Int. Cl.[2] C08F *8/00*

U.S. Cl. 204—159.15 **11 Claims**

1. A method of producing a cured polyurethane which comprises subjecting a layer of a curable polyurethane composition to ionizing radiation or actinic light sufficient to cure said layer, said curable polyurethane composition consisting essentially of

A. the reaction product of

a. a polyester polyol,

b. an organic isocyanate, and

c. a hydroxyl-containing ester having a terminal acrylyl or alpha-substituted acrylyl group,

wherein the number of isocyanate groups of the reactants is not greater than the number of hydroxyl groups of the reactants; and

B. up to 25 percent based on the total weight of (A) and (B) of a radiation-sensitive monoethylenically unsaturated monomer.

4,082,635

ULTRAVIOLET LIGHT-CURABLE DIACRYLATE HYDANTOIN ADHESIVE COMPOSITIONS

André Fritz, and Barbara Lee Dunn, both of Okemos, Mich., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

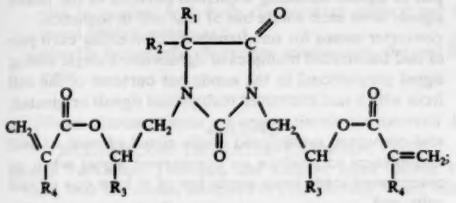
Filed Aug. 2, 1976, Ser. No. 711,002

Int. Cl.[2] C08F *2/46, 30/08*

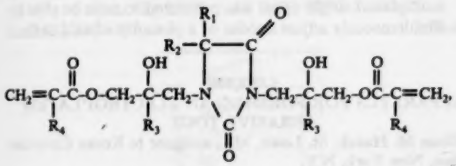
U.S. Cl. 204—159.23 **4 Claims**

1. An ultraviolet light-curable adhesive composition comprising:

(a) from 25–75 parts of a diacrylate of the formula

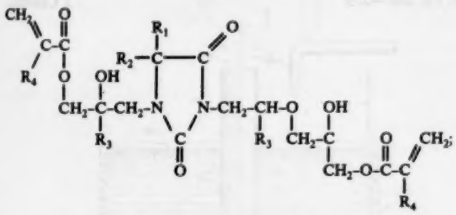


(b) from 25–75 parts of a diacrylate comprising
(1) from 80 to 100 parts of a compound of the formula



and

(2) from 0 to 20 parts of a compound of the formula



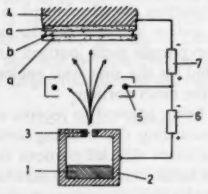
(c) from 0.01 to 2 parts of an organosilane adhesion promoter; and
(d) from 0.01 to 3 parts of a light sensitizer wherein each of R_1 and R_2 is hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, or phenyl or together R_1 and R_2 is tetramethylene or pentamethylene; and R_3 and R_4 are hydrogen or methyl.

4,082,636

ION PLATING METHOD

Toshinori Takagi, Nagaokakyo, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1976, Ser. No. 648,296
Claims priority, application Japan, Jan. 13, 1975, 50-6666; Jan. 13, 1975, 50-7304[U]
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 N **6 Claims**



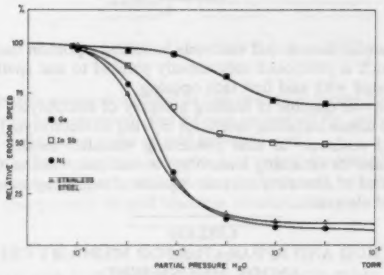
1. An ion plating method comprising the steps of:
preparing an ion plating device which comprises an ionization electrode assembly for ionizing material to be deposited, an ion accelerator electrode assembly for accelerating the ionized particles of the material and a substrate on which the ionized particles together with neutral particles are deposited;
applying a first variable-voltage power source between the ionization electrode assembly and the ion accelerator electrode assembly;
applying a second variable-voltage power source between the ion accelerator electrode assembly and the substrate;
varying the output of the first and second variable-voltage power sources to regulate the ratio of ionized particles to neutral particles, which are incident on the substrate, thereby forming a multi-layer structure of deposited films.

4,082,637

PROCESS FOR MANUFACTURING SEMICONDUCTOR STRUCTURES BY SPUTTER ETCHING

Carlo Misiano; Karl Heinz Diedrich, and Enrico Simonetti, all of Rome, Italy, assignors to Selenia-Industrie Elettroniche Associate S.p.A., Naples, Italy

Filed Oct. 7, 1976, Ser. No. 730,542
Claims priority, application Italy, Nov. 24, 1975, 52375 A/75
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 E **12 Claims**



1. A process for manufacturing a semiconductor monocrystalline structure by sputter etching a semiconductor substrate material having a masking material thereon, said process comprising sputter etching said substrate material with an electric discharge at a higher rate than said masking material is etched, in a rarefied atmosphere of:
(a) Argon and hydrogen; or
(b) Argon and H_2O; or
(c) an inert gas and a gas developing hydrogen ions to thereby reduce surface contamination of said substrate material by back scattering of said masking material.

4,082,638

APPARATUS FOR INCREMENTAL ELECTRO-PROCESSING OF LARGE AREAS

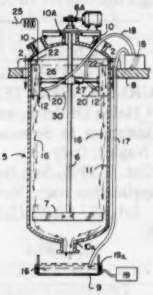
John F. Jumer, 16 W. 131 Timber Trails Dr., Elmhurst, Ill. 60126

Division of Ser. No. 507,534, Sep. 9, 1974, Pat. No. 4,001,094. This application Dec. 21, 1976, Ser. No. 753,002
Int. Cl.² C25F *3/16*; B23P *1/12*; C25D *17/12, 21/10*
U.S. Cl. 204—213 **4 Claims**

1. Apparatus for incrementally electropolishing the interior metal surface of a stationary vertically oriented vessel having closed ends and a sidewall generally concentric about its vertical axis with at least one of said closed ends having an access port, said vessel including an agitator therein positioned on a shaft which is adapted for rotation, and said shaft being mounted along at least a portion of the vertical axis of said vessel, said apparatus comprising:
an extensible arm including a collar adapted to be mounted on said shaft to extend generally horizontally therefrom, said collar mounting being detachable for selectively changing the vertical position of said arm on said shaft;

processing chamber means mounted on the distal ends of said arm, and including a first face opening thereon for sequentially masking increments of said metal surface to be electro-polished, said face opening including a sealing means at the edges thereof for substantially sealingly engaging an incremental area of said metal surface, and said chamber means including a substantially open top portion thereof;

an ungrounded electrode being positioned in said processing



chamber means, said electrode including a portion thereof which is positioned substantially parallel to and spatially related with said first face opening;

a reservoir capable of holding a supply of electrolyte;

pump means including means for moving an electrolyte from said reservoir to said processing chamber means, and means for returning electrolyte to said reservoir; and

a source of electrical current capable of supplying same to said electrode.

4,082,639

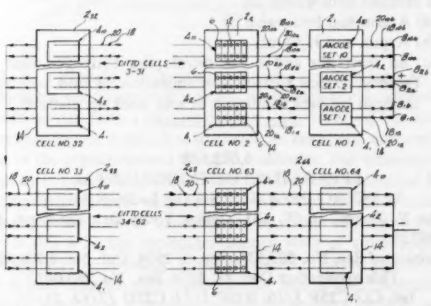
METHOD AND APPARATUS FOR MERCURY CELL ANODE ADJUSTMENT

Richard W. Ralston, Jr., and George K. Ames, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 22, 1976, Ser. No. 725,918

Int. Cl.[2] C25B *15/04, 9/04*

U.S. Cl. 204—219 **24 Claims**



1. In a mercury cell circuit having a plurality of liquid cathode electrolytic cells in series, each of said cells having at least one anode, at least one motor means associated with each cell for raising at least one anode of said associated cell and a plurality of anode buses, the improvement comprising:

a. signal generator means for generating signals from two spaced apart paired taps on each anode bus of each cell,

b. first and second solid state multiplexer means associated with a first and second one of said cells, respectively, and independently simultaneously operable for fast scanning the signals from each anode bus of said first and second cell, respectively, and continuously and simultaneously transmitting a pair of signals from each of said cells, said pair of signals including sequential portions of the paired signals from each anode bus of that cell in sequence,

c. converter means for simultaneously converting each pair of said transmitted multiplexed signals into a single analog signal proportional to the anode bus currents of the cell from which said converted multiplexed signals originated,

d. overcurrent circuit means for simultaneously modifying said converted multiplexed single signal of each of said multiplexers to produce an overcurrent signal when an overcurrent exists in an anode bus of at least one of said cells, and

e. transmitter means for simultaneously transmitting said overcurrent signal of each multiplexer to the motor means associated with the anode bus from which the converted multiplexed single signal was generated so as to be able to simultaneously adjust anodes of a plurality of said cells.

4,082,640

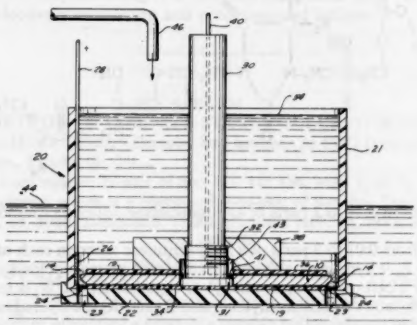
APPARATUS FOR FORMING AN ELECTROPLATED ABRASIVE TOOL

William M. Haack, St. Louis, Mo., assignor to Keene Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 545,984, Jan. 31, 1975, Pat. No. 3,957,593. This application May 7, 1976, Ser. No. 684,005

Int. Cl.[2] C25D *17/06, 17/18*

U.S. Cl. 204—279 **2 Claims**



1. Apparatus useful in the initial application by electroplating of abrasive particles in substantially single layer thickness to the working surface formed around the peripheral area of a disc-shaped abrasive wheel blank which comprises:

a first tank formed with an impervious side wall enclosure slightly larger in diameter than the diameter of the abrasive wheel blank and a base having openings therethrough adjacent the periphery of the container and having a porous mesh portion extending across such openings, the said mesh being smaller in size than the size of the abrasive particles to be applied to the working surface;

a fixture for supporting the wheel blank in the first tank with its working surface spaced from the side wall enclosure and from the porous mesh portion to define a narrow space bounded by the side wall enclosure, the working surface and the mesh portion;

the said space being adapted to receive a mass of abrasive particles surrounding the working surface with abrasive particles in contact with all portions thereof and to provide an area for a concentrated flow of plating solution downwardly through the said space, mesh, and base openings;

means for supporting metal plating material inside the side wall enclosure and adjacent the working surface and for connecting it as an anode and for connecting the working surface of the blank as a cathode in an electroplating circuit when the plating solution is flowed downwardly

over the working surface and through the mass of particles in contact with both the working surface and the metal plating anode; and

means for feeding the electrolyte solution into the said first tank.

4,082,641

REUSABLE INTEGRATED CATHODE UNIT

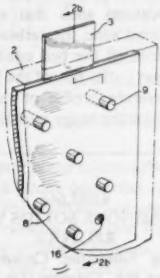
Ronald Parkinson, Thornhill, and Richard Allan Sinton, Toronto, both of Canada, assignors to Falconbridge Nickel Mines Limited, Toronto, Canada

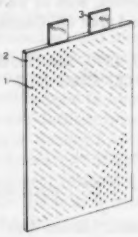
Filed Nov. 2, 1976, Ser. No. 738,148

Claims priority, application United Kingdom, Apr. 1, 1976, 13340/76

Int. Cl.² C25D *1/10, 1/20;* C25C *7/02*

U.S. Cl. 204—281 **7 Claims**





1. A rectangular reusable cathode unit having two working faces for the simultaneous batch electrodeposition thereon of a multiplicity of discrete metal deposits, the cathode unit comprising an integrated whole of two interlocking parts, a substantially ridid slab of non-conductive material with a conductive metal assembly embedded therein, said assembly having projections at spaced locations that penetrate the surface of the slab thereby forming an array of solid, conductive metal islands, each metal island having a surface area of less than about 0.2 square inches and more than about 0.02 square inches and being flush with or raised above the surface of the slab and separated from each other sufficiently for the electrodeposition of discrete metal deposits thereon, each of which has a basal area several times larger than that of the island on which it is deposited.

4,082,642

MEASURING ARRANGEMENT

Helmut Hönig, Seebachergasse 10, 8010 Graz, Austria

Continuation of Ser. No. 340,318, Mar. 12, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,121

Claims priority, application Austria, Mar. 13, 1972, 2074/72

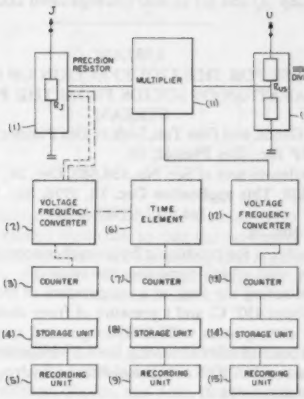
Int. Cl.² C25D *13/00, 13/06*

U.S. Cl. 204—299 EC **7 Claims**

1. An arrangement for measuring electrical parameters of binders subjected to an electrodeposition current, said arrangement comprising, in combination

resistor means for providing a voltage proportional to said electrodeposition current;

converter means connected to said resistor means for producing a sequence of impulses having a frequency proportional to said voltage;



counter means connected to said converter means for counting said impulses, and having an output for providing a cumulative count of said impulses; and

recording means connected to said output for recording at a predetermined rate said cumulative count, whereby the charge yield of said binder is recorded.

4,082,643

PROCESS FOR THE LIQUEFACTION OF COAL AND SEPARATION OF SOLIDS FROM THE PRODUCT STREAM

John G. Gatsis, and Gim Tan, both of Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 536,680, Dec. 26, 1974, Pat. No. 3,997,425. This application Dec. 14, 1976, Ser. No. 750,481

Int. Cl.² C10G *1/06*

U.S. Cl. 208—8 **5 Claims**

1. A process for producing hydrocarbonaceous liquid products from coal which comprises the steps of:

(a) contacting the coal, at a temperature of from about 150° to about 450° C. and a pressure of from about 10 to about 300 atmospheres with a hydrogenated coal oil solvent having been hydrogenated to remove at least about 80% of the asphaltenes, and hydrogen;

(b) separating gas from the resultant mixture to provide a liquid phase comprising coal extract, a hydrogen-depleted liquefaction zone effluent solvent and finely divided solid particles;

(c) supplying said liquid phase including substantially all of said hydrogen-depleted liquefaction zone effluent solvent, to a pre-mix zone and therein commingling the same with from about 10 weight percent to about 1000 weight percent of a light aromatic solvent selected from the group consisting of benzene, toluene and xylene and with from about 0.1 weight percent to about 1000 weight percent of fresh hydrogenated coal oil solvent having been hydrogenated to remove at least about 80% of the asphaltenes at a temperature of from about 10° to about 150° C. and a pressure of from about atmospheric to about 25 atmospheres;

(d) introducing the mixture from the pre-mix zone to a separation zone and therein separating a solid ash from the admixed liquids;

(e) thereafter removing said light aromatic solvent from said admixed liquids in a solvent recovery zone;
(f) removing an ash-free hydrocarbon stream from said solvent recovery zone and hydrogenating at least a portion thereof to form a hydrogenated coal oil, said coal oil having been hydrogenated to remove at least about 80% of the asphaltenes; and
(g) supplying at least a portion of said hydrogenated coal oil to step (a) and (c) as said hydrogenated coal oil solvent.

4,082,644

PROCESS FOR THE LIQUEFACTION OF COAL AND SEPARATION OF SOLIDS FROM THE PRODUCT STREAM

John G. Gatsis, and Gim Tan, both of Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 536,680, Dec. 26, 1974, Pat. No. 3,997,425. This application Dec. 14, 1976, Ser. No. 750,482
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—8 **6 Claims**

1. A process for producing hydrocarbonaceous liquid products from coal which comprises the steps of:
(a) contacting the coal, at a temperature of from about 150° to about 450° C. and a pressure of from about 10 to about 300 atmospheres with a hydrogenated coal oil solvent, said coal oil solvent having been hydrogenated to remove at least about 80% of the asphaltenes, hydrogen and a light aromatic solvent;
(b) separating gas from the resultant mixture to provide a liquid phase comprising coal extract, solvent and finely divided solid particles;
(c) supplying said liquid phase, including substantially all of said coal oil solvent, to a pre-mix zone and therein commingling the same with from about 5 weight percent to about 1000 weight percent of a light aromatic solvent selected from the group consisting of benzene, toluene and xylene at a temperature of from about 10° to about 150° C. and a pressure of from about atmospheric to about 25 atmospheres;
(d) introducing the mixture from the pre-mix zone to a separation zone and therein separating a solid ash from the admixed liquids;
(e) thereafter removing said light aromatic solvent from said admixed liquids in a solvent recovery zone;
(f) removing an ash-free hydrocarbon stream from said solvent recovery zone and hydrogenating at least a portion thereof to form a hydrogenated coal oil, said coal oil having been hydrogenated to remove at least about 80% of the asphaltenes; and
(g) supplying at least a portion of said hydrogenated coal oil to step (a) as said hydrogenated coal oil solvent.

4,082,645

RECOVERY OF HYDROCARBON VALUES BY CONTROLLED EDUCTION AND OXIDATION OF OIL SHALE

John H. Knight, Littleton; Lewis A. St. Cyr, Evergreen, both of Colo., and Omer L. Wilson, Houston, Tex., assignors to The Superior Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 567,546, Apr. 14, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,409
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R **8 Claims**

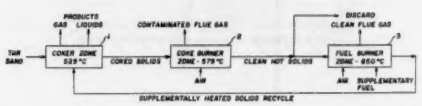
1. In the process for recovering oil from oil shale wherein hot reducing or inert gases are passed in cross-flow fashion through a moving quiescent bed of crushed shale in a direction normal to the direction of travel of said bed to heat the shale particles in said bed to oil-educing temperatures and strip the oils from the shale, leaving a non-vaporizable carbonaceous residue in the spent shale, the improvement which comprises:
in a first zone, passing hot reducing or inert gases through said moving bed at a temperature and flow rate sufficient to heat only a portion of the layers of particles at the gas inlet side of the bed to oil educing temperatures and to establish within said bed a temperature range below that at which adverse chemical reactions involving the shale would occur;
thereafter, prior to the time when the particles in those regions of the bed which are farthest from the gas inlet side have reached oil-educing temperatures but while the particles at the gas inlet side remain above oil educing temperatures, transferring said bed to a second zone;
in said second zone, directing oxygen-containing gases through the bed from said gas inlet side, whereby a substantial portion of the carbonaceous residue in the spent shale regions of the bed is oxidized, producing and transferring heat to the deeper regions within said bed,
the oxygen mass flow rate of said oxygen-containing gases being initially set and thereafter incrementally adjusted at downstream locations such that as the bed proceeds through said second zone, the carbonaceous residue in the remaining portions of the bed continues to be oxidized through to the gas outlet side of the bed while at the same time the temperature profile of the bed is maintained within the temperature range established in the first zone.

4,082,646

COKING OF BITUMINOUS SOLIDS WITH HOT SOLIDS RECYCLE

Peter Charles Flynn, Edmonton, Canada, assignor to Petro-Canada Exploration Inc., Calgary; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation; Imperial Oil Limited, both of Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of, Canada

Filed Jun. 17, 1977, Ser. No. 807,349
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R **3 Claims**

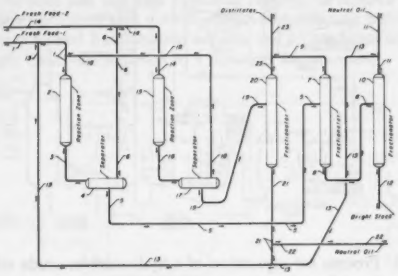


1. In the process wherein a feed stock comprising naturally occurring hydrocarbons associated with mineral solids, such as bituminous sands, are thermally cracked in a coking reaction zone, and coked solids produced therefrom are introduced into a burning zone wherein the coke is burned from the solids, supplemental fuel addition to said burning zone being required to maintain heat balance, and part or all of the produced hot clean solids, having a required heat content, is recycled to the coking reaction zone to supply heat thereto,
the improvement comprising:
burning substantially all the coke of the coked solids in a coke burning zone with air or oxygen and the minimum amount of supplemental fuel needed, to produce clean hot solids and flue gas containing a relatively high concentration of pollutant compounds and fine solids;
introducing at least part of the clean hot solids into a fuel burning zone and combusting a further portion of supplemental fuel needed to maintain heat balance and air or oxygen in said zone to further heat the solids, thereby producing clean supplementally heated solids, having the heat content required for the coking reaction zone, and flue gas containing a relatively low concentration of pollutant compounds and fine solids; and
recycling supplementally heated solids to the coking reaction zone for heating.

4,082,647
SIMULTANEOUS AND CONTINUOUS HYDROCRACKING PRODUCTION OF MAXIMUM DISTILLATE AND OPTIMUM LUBE OIL BASE STOCK

Le Roi E. Hutchings, Mt. Prospect, and Thomas E. Sahlin, Elmhurst, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 9, 1976, Ser. No. 749,138
Int. Cl.[2] C10G *13/04, 37/02, 41/00*
U.S. Cl. 208—78 5 Claims



1. A process for producing hydrocarbon distillates and lubricating oil base stock which comprises the steps of:

(a) subjecting a first hydrocarbon charge stock and hydrogen to hydrocracking in a first hydrocracking reaction zone, at hydrocracking conditions, in contact with a first hydrocracking catalyst containing at least one metallic component selected from Groups VIB and VIII of the Periodic Table;

(b) separating the resulting first zone effluent in a first separation zone, to provide a first principally vaporous phase and a first principally liquid phase consisting essentially of hydrocarbon distillate and lubricating oil;

(c) subjecting said first vaporous phase and a second, lower boiling hydrocarbon charge stock in a second hydrocracking reaction zone to hydrocrack said lower boiling hydrocarbon to a distillate possessing a lesser boiling point than said lower boiling hydrocarbon in contact with a second hydrocracking catalyst containing at least one metallic component selected from Groups VIB and VIII of the Periodic Table at hydrocracking conditions;

(d) separating the resulting second zone effluent in a second separation zone, to provide a second principally vaporous phase and a second principally liquid phase consisting essentially of hydrocarbon distillates and lubricating oil;

(e) separating said first liquid phase in a second fractionation zone to recover said distillate as the overhead effluent and said lubricating oil as the bottoms effluent; and

(f) separating said second liquid phase in a first fractionation zone to recover said distillate as the overhead effluent and said lubricating oil as the bottoms effluent.

4,082,648
PROCESS FOR SEPARATING SOLID ASPHALTIC FRACTION FROM HYDROCRACKED PETROLEUM FEEDSTOCK

James R. Murphy, Houston, Tex., assignor to Pullman Incorporated, Chicago, Ill.

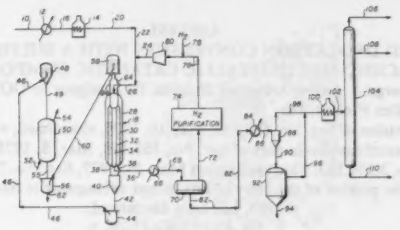
Filed Feb. 3, 1977, Ser. No. 765,141
Int. Cl.[2] C10G *31/06, 31/10, 13/00, 23/00*
U.S. Cl. 208—97 12 Claims

1. A process for upgrading a petroleum feedstock having at least 5 ppm metals and a Conradson carbon residue of from about 2.0 weight percent to about 25.0 weight percent, comprising the steps of:

(a) contacting the feedstock in a mild hydrocracking zone in the presence of 700 to 3000 psig partial pressure of hydrogen at a temperature of from about 750° F to about 850° F with a cracking catalyst;

(b) separating the mildly hydrocracked feedstock from the cracking catalyst;

(c) cooling the mildly hydrocracked feedstock to a temperature below about 600° F to precipitate a solid asphaltic fraction from the mildly hydrocracked feedstock; and



(d) separating the solid asphaltic fraction from the mildly hydrocracked feedstock so that the portion of the mildly hydrocracked feedstock remaining after separation of the asphaltic fraction is a substantially upgraded feedstock.

4,082,649
HYDROCRACKING HYDROCARBONS OVER TRI-METALLIC CATALYST

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 715,813, Aug. 19, 1976, Pat. No. 4,013,548, which is a division of Ser. No. 672,183, Mar. 31, 1976, Pat. No. 4,003,954, which is a continuation-in-part of Ser. No. 538,240, Jan. 2, 1975, Pat. No. 3,957,624. This application Jan. 27, 1977, Ser. No. 763,270
Int. Cl.[2] C10G *13/06;* B01J *26/06, 29/12*
U.S. Cl. 208—111 3 Claims

1. A process for hydrocracking a hydrocarbonaceous charge stock into lower molecular weight hydrocarbons, which process comprises reacting said charge stock with hydrogen at hydrocracking conditions, and in contact with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.5 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % germanium and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, cobalt and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal, and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states, and separating the resulting reaction zone effluent to recover said lower molecular weight hydrocarbons.

4,082,650
MANUFACTURE OF PETROLEUM COKE WITH FINES RECYCLING

Ke Wen Li, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 640,827, Nov. 28, 1975, abandoned, which is a continuation of Ser. No. 485,174, Jul. 2, 1974, abandoned. This application Jan. 7, 1977, Ser. No. 757,426
Int. Cl.[2] C10G *9/14*
U.S. Cl. 208—131 4 Claims

1. In a process for producing delayed petroleum coke comprising introducing a normally liquid hydrocarbon coker feedstock into a delayed coking drum under delayed coking conditions to produce delayed coke therein, the improvement wherein coke fines are added to said coking drum prior to introduction of said coker feedstock thereto, and said coke fines are preheated to approximately the temperature of said

coker feedstock after being added to said coking drum but prior to introduction of said coker feedstock into said coking drum.

4,082,651

HYDROCARBON CONVERSION WITH A SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 684,812, May 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 555,648, Mar. 5, 1975, Pat. No. 3,956,103. This application Mar. 25, 1977, Ser. No. 781,388
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 **14 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with a sulfided acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 2 wt. % rhenium, about 0.1 to about 3.5 wt. % halogen, and about 0.01 to about 1 wt. % sulfur; wherein the platinum or palladium, rhodium and rhenium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium is present in a sulfided state or in a mixture of the sulfided state and the elemental metallic state; wherein substantially all of the rhenium and rhodium are present in a sulfided state or in the elemental metallic state or in a reducible oxide state or in a mixture of these states; and wherein the composite has been sulfided, prior to contact with the hydrocarbon and after substantially all of at least the platinum or palladium contained therein has been reduced to the elemental metallic state, by treatment with a sulfiding gas at conditions selected to incorporate about 0.01 to about 1 wt. % sulfur.

4,082,652

PROCESS FOR IMPROVED CARBON-SUPPORTED HYDRODESULFURIZATION CATALYSTS

John Davidson Voorhies, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 562,524, Mar. 27, 1975, abandoned. This application Jan. 15, 1976, Ser. No. 649,374
Int. Cl.[2] C10G *23/02;* B01J *27/02*
U.S. Cl. 208—216 **10 Claims**

1. A process for preparing an improved hydrodesulfurization catalyst for petroleum fractions which comprises:

(1) depositing upon a carbon support sufficient of a molybdenum compound capable of being converted to MoS_2 to provide a support after said conversion containing from about 5 to about 25 weight percent MoS_2, based on the weight of said support;

(2) treating the support obtained from step (1) to convert said molybdenum compound to MoS_2;

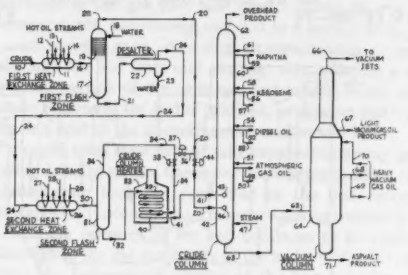
(3) depositing upon the support obtained from step (2) in at least one step sufficient of a molybdenum compound capable of being converted to MoS_2 to increase the content of MoS_2 on said support after said conversion to a total of about 10 to about 25 weight percent, based on the weight of said support, and sufficient of a metal compound selected from the group consisting of nickel and cobalt compounds capable of being converted to corresponding metal sulfide to provide from about 0.4 to 8.0 weight percent of said metal compound, based on the weight of said support.

4,082,653

CRUDE OIL DISTILLATION PROCESS

Richard Raymond DeGraff, 1505 E. Central Rd., Arlington Heights, Ill. 60005

Filed Nov. 17, 1976, Ser. No. 742,415
Int. Cl.[2] C10G *7/00, 31/08, 34/00*
U.S. Cl. 208—251 R **18 Claims**



1. Process for separation of a hydrocarbon crude oil into a plurality of product fractions which comprises:

(a) Passing a hydrocarbon crude oil containing water soluble contaminants into a first heat exchange zone at a first elevated pressure and a first temperature;

(b) Heating said crude oil within said heat exchange zone to a second temperature above said first temperature;

(c) Passing heated crude oil into a first flash zone maintained under conditions sufficient to separate said heated crude oil into a first flash vapor and a first flash liquid, said conditions including a second elevated pressure below said first elevated pressure;

(d) Contacting said first flash vapor with water under conditions sufficient to remove water soluble contaminants therefrom and thereby produce water containing water soluble contaminants;

(e) Passing said first flash liquid and said water containing water soluble contaminants, into a separation zone maintained under conditions sufficient to remove water soluble contaminants from said first flash liquid; and,

(f) Passing at least a portion of first flash liquid having substantial freedom from water soluble contaminants, into a crude oil fractionation zone.

4,082,654

FRACTIONATION TO REMOVE A HIGH-BOILING MATERIAL AND A DISSOLVED SUBSTANCE

Steve A. Gewartowski, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 583,740, Jun. 4, 1975, Pat. No. 4,008,150. This application Oct. 29, 1976, Ser. No. 737,127
The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.
Int. Cl.[2] B01D *3/06;* C01G *7/00*
U.S. Cl. 208—352 **6 Claims**

1. A method for removing a high-boiling material and a volatile dissolved substance chosen from the group consisting of hydrogen sulfide, nitrogen, sulfur dioxide, helium, carbon monoxide, carbon dioxide, ammonia, acetylene, ethylene, propylene, boron trifluoride, hydrogen fluoride and carbon tetrachloride from a naphtha feed stream comprising hydrocarbons having boiling points in the range of about 40° C. to about 260° C. which comprises the steps of:

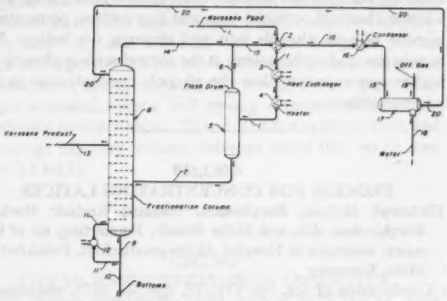
(a) passing said feed stream into a flash zone and effecting the vaporization of about 25 to 75 vol.% of said feed stream and the formation of a single flash vapor stream comprising substantially all of the volatile dissolved substances and a single flash liquid stream comprising substantially all of the high-boiling material;

(b) passing said single flash liquid stream into a fractionation

column at a first intermediate point and effecting the fractional distillation of said single flash liquid stream;

(c) removing an overhead vapor stream from said fractionation column, and passing said overhead vapor stream through a condensation zone and into an overhead receiver to remove at least a portion of the volatile dissolved substances therein and to condense said overhead vapor stream;

(d) passing said single flash vapor stream through a condensation zone and into said overhead receiver to remove at least a portion of said volatile dissolved substances before charge to said fractionation column and to condense said single flash vapor stream to a liquefied flash stream;



(e) removing a reflux stream comprising an admixture of said condensed overhead stream and said liquefied flash stream from said overhead receiver and passing said reflux stream into an upper portion of said fractionation column;

(f) removing a vapor stream comprising said dissolved substances from said overhead receiver;

(g) removing a substantially dissolved volatile and high-boiling material free product stream from the fractionation column at a second intermediate point located above the first intermediate point; and,

(h) removing a bottoms liquid stream comprising the high-boiling material from the fractionation column.

4,082,655

PECAN-WORM SEPARATOR PROCESS AND APPARATUS

Romeo T. Toledo, Athens, Ga., assignor to Tracy-Luckey Co., Inc., Harlem, Ga.

Filed Aug. 23, 1976, Ser. No. 716,634
Int. Cl.[2] B03D 1/14
U.S. Cl. 209—173 **13 Claims**

1. The method of separating pecan nut meats from pecan weevil larvae therewith, which comprises the steps of:

(a) providing a trough having a bottom opening at one end;

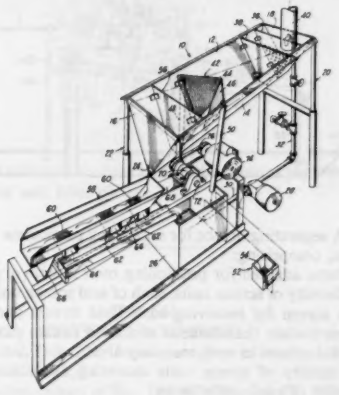
(b) effecting a continuous flow through said trough of a liquid medium which is a mixture of water and alcohol acceptable as a food additive by continuously discharging the liquid medium through said bottom opening at said one end of the trough while continuously introducing the liquid medium into the other end of said trough at a rate sufficient to entrain and carry along said pecan meats while maintaining a selected level of the liquid medium within said trough;

(c) introducing pecan nut meats containing said larvae into said liquid medium adjacent said other end of the trough;

(d) adjusting the ratio of alcohol and water in said medium to obtain a specific gravity of the liquid medium which is within the range 0.91 to 0.95 and which specific gravity is effective to float substantially all of said larvae and only a negligible amount of said pecan nut meats on the surface of said liquid medium while allowing substantially all of the pecan meats to sink;

(e) intercepting and removing the entrained floating material at a region between the region of introduction of step (c) and said one end of the trough while simultaneously directing the entrained sunken material toward said bottom opening;

(f) continuously discharging the liquid material with entrained sunken material from said bottom opening onto a porous conveyor and recirculating the liquid medium passing through the conveyor back for introduction into the trough in step (b); and



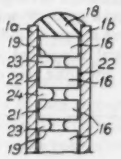
(g) continuously recovering the pecan meats from the conveyor and drying them to obtain an edible product.

4,082,656

FILTER DISC FOR MAGNETIC SEPARATOR

Per Hedvall, and Per Strandberg, both of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Dec. 3, 1975, Ser. No. 637,408
Claims priority, application Sweden, Jan. 9, 1975, 75001941
Int. Cl.[2] B03C 1/02
U.S. Cl. 209—222 **4 Claims**

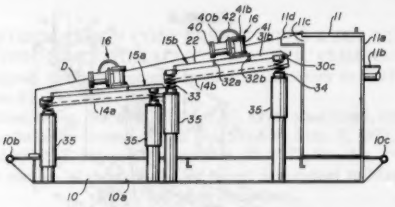


1. Filter disc for magnetic separator comprising two wall discs and a layer of parallelepipedal permanent magnets arranged between them, each permanent magnet having sides facing the wall discs and adjacent permanent magnets abutting each other along parallel sides, said permanent magnets being fixed to the wall discs by a layer of glue, said permanent magnets having bevelled edges perpendicular to the surfaces facing the wall discs to form holes at the corners of adjacent magnets, said holes containing glue projecting into them from the layer of glue.

4,082,657
SEPARATOR APPARATUS

Ernest L. Gage, Box 1687, Monahans, Tex. 79756

Filed Jan. 19, 1976, Ser. No. 650,286
Int. Cl.[2] B07B *1/28*
U.S. Cl. 209—311 5 Claims



1. A separating device for separating particulate from a fluid stream, comprising:

a frame adapted for positioning over a recovery area;

a plurality of screen units, each of said screen units including a screen for receiving such fluid stream and separating particulate therefrom as said fluid stream passes through said screen to such recovery area;

a plurality of screen units mounting assemblies mounting each of said screen units;

vibration mount means mounting each of said screen unit mounting assemblies for vibratory motion with respect to said frame;

fluid inlet means mounted with said frame for receiving said fluid stream and directing said fluid stream over said vibrating screen units;

each of said screen unit mounting assemblies having release means for releasably mounting one of said screen units for vibratory motion, said release means including inflatable means movable between a screen unit holding position when inflated, in which position said inflatable means engages and holds said screen unit for vibration, and a screen unit releasing position when deflated, in which said screen unit is released from engagement with said screen unit mounting assembly so that said screen unit is easily removed;

vibrating means mounted with each of said screen unit mounting assemblies for vibrating such screen unit mounting assembly and said screen unit mounted therein by said release means for vibratory movement in mutually perpendicular directions;

said vibration mount means including a plurality of posts mounted with said frame for each screen unit, means mounting each of said screen mounting assemblies on a plurality of said posts, said posts having height adjustment means for adjusting the height of said posts in order to adjust the angular position of each of said screen mounting assemblies and screen units mounted therewith;

said height adjustment means including a cap mounted over said posts for vertical movement with respect thereto; and

means for vertically adjusting said cap with respect to said post.

4,082,658
HOLLOW FIBER MEMBRANES OF ETHYLENE COPOLYMERS AND PROCESS FOR USE

Alfred Keith Fritzsche, Cary, N.C., and Richard L. Leonard, Decatur, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 9, 1977, Ser. No. 767,096
Int. Cl.[2] B01D *13/00, 31/00*
U.S. Cl. 210—22 R 22 Claims

1. A hollow fiber membrane consisting of a copolymer of ethylene with from 5 to 20 weight percent of a copolymerized vinyl monomer having an outside diameter of from 50 to 1000 microns, a wall thickness having a ratio of from 0.1 to 0.4 of said outside diameter and having a intrinsic permeability of phenol determined in a dilute aqueous solution of phenol at about 70° C of from about 5 to about 100×10^{-8} cc's per cm thickness per second per square centimeter per volume fraction differential.

10. The process for the separation of phenols from aqueous solutions of phenols comprising contacting an aqueous solution of phenols with a first surface of a hollow fiber membrane consisting of a copolymer of ethylene and from 5 to 20 weight percent of a copolymerized vinyl monomer, said membrane having an intrinsic permeability to phenol determined in a dilute aqueous solution of phenol at about 70° C of from about 5 to about 100×10^{-8} cc's per cm thickness per second per square centimeter per volume fraction differential, maintaining a second and opposite surface of said hollow fiber membrane at a lower chemical potential than said first surface, permeating a portion of said phenols into and through the hollow fiber membrane, and withdrawing at the second surface phenols at a higher concentration than the phenols concentration in said aqueous solution.

4,082,659
PROCESS FOR CONCENTRATING LATICES

Christoph Heinze, Burghausen, Salzach; Kasimir Ruchlak, Burgkirchen, Alz, and Holm Steude, Emmerting, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 571,227, Apr. 24, 1975, abandoned. This application Nov. 11, 1976, Ser. No. 741,042
Claims priority, application Germany, Apr. 30, 1974, 2420922
Int. Cl.[2] B01D *13/00;* C08F *14/06*
U.S. Cl. 210—23 F 3 Claims

1. In a process for concentrating latices which are prepared by emulsion polymerization of vinyl chloride or of vinyl chloride and monomers copolymerizable with vinyl chloride by ultrafiltration by means of a semipermeable membrane of polyacrylonitrile, polymethylmethacrylate or polyamide having a partition cut at a molecular weight of from 10,000 to 50,000, the improvement which comprises the treatment of the membrane, prior to the ultrafiltration, with an aqueous solution having 0.5 to 70 weight % of one or more emulsifiers which are suitable for the emulsion polymerization of vinyl chloride or of vinyl chloride and monomers copolymerizable with vinyl chloride.

4,082,660
METHOD OF PURIFICATION

Eugéne Papirer, Pfastatt, and Jean-Baptiste Donnet, Didenheim, both of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Continuation of Ser. No. 579,210, May 20, 1975, abandoned, which is a continuation of Ser. No. 412,126, Nov. 2, 1973, abandoned. This application Feb. 25, 1976, Ser. No. 661,347
Claims priority, application France, Nov. 3, 1972, 72.38973
Int. Cl.[2] C02B *9/02*
U.S. Cl. 210—36 7 Claims

1. A method for the removal of hydrocarbons from water polluted with same comprising contacting said polluted water with an effective amount of a purification agent comprising particles of a pulverulent mineral solid selected from the group consisting of silica, silicates, silicoaluminates, metallic carbonates and oxides of zinc, titanium and aluminum, the surface of said particles having fixed thereon chains of polymer selected from the group consisting of macro-molecular paraffins and their derivatives, polyvinyl derivatives, polydienes, polyolefins and polystyrenes, said chains of polymer being fixed to the surface of said particles by graft reaction of said polymer with the surface of said particles, whereby the hydrocarbon is absorbed by the polymer, the purification agent being then recovered.

4,082,661

ACTIVATED CARBON AND PREPARATION THEREOF

Takao Aoki, Fuchu; Yuji Kako, Ichikawa; Toyoji Kikuga, and Keizo Hatano, both of Fujieda, all of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Jul. 29, 1975, Ser. No. 600,030
Claims priority, application Japan, Aug. 1, 1974, 49-87553
Int. Cl.[2] B01D *15/00*
U.S. Cl. 210—40 10 Claims

7. In the process of purifying aqueous liquids contaminated with impurities selected from the group consisting of phenol, live bacilli, pyrogen, and water-soluble organic dyestuffs, which comprises filtering the contaminated liquid with an inorganic filter and contacting the contaminated liquid with activated carbon, the improvement which comprises employing as said filter and activated carbon an inorganic porous article impregnated with a non-oxidatively carbonized cured phenolic resin, said filter containing at least about 2 percent by weight activated carbon and having a main capillary radii distribution between about 100 and 50,000 Angstrom units, and an average capillary volume between about 0.05 ml./g. and about 0.5 ml./g.

4,082,662

LIQUID WASTE TREATMENT APPARATUS

Jack E. Prince; Franklin E. Terry, both of 2927 31st St., Port Arthur, Tex. 77640, and William H. Mullins, 230 W. Kings Hwy., San Antonio, Tex. 78212

Division of Ser. No. 580,521, Jun. 23, 1975, Pat. No. 3,996,139, which is a continuation-in-part of Ser. No. 329,441, Feb. 5, 1973, abandoned. This application Sep. 30, 1976, Ser. No. 727,904
Int. Cl.[2] C02B *3/08*
U.S. Cl. 210—63 R 5 Claims

1. A method for pretreating liquid waste consisting of the following steps:

a. pumping said liquid waste through a pipe into an aerator;
b. horizontally discharging said liquid waste from a reduced diameter nozzle inside said aerator into an elongated, uniform cross section mixing chamber;
c. first breaking up of organic solids in said liquid waste to release entrained gas by shearing action upon said horizontally discharging through said reduced diameter nozzle;
d. aspirating air into said mixing chamber around said nozzle;
e. first mixing of said air and liquid waste by turbulence inside said mixing chamber; and
f. second mixing of said air and liquid waste and second breaking up of organic solids to further release entrained gas by an abrupt termination of said mixing chamber into a larger cross sectional area at ambient pressure.

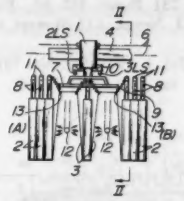
4,082,663

METHOD OF POSITIONING A FILTER CAKE DISCHARGE DEVICE FOR A FILTER PRESS

Nobuo Sato, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Dec. 27, 1976, Ser. No. 754,842
Claims priority, application Japan, Jan. 7, 1976, 51-1737
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—79 3 Claims

1. A method of positioning a filter cake discharge device for a filter press travelling above filter plates in a moving direction of said filter plates, comprising determining a relative position of said filter cake discharge device with respect to said filter plates by utilizing each signal from a switch provided on said discharge device for detecting a position of said filter cake discharge device and a pair of switches provided on said discharge device for detecting a condition of said filter plates,



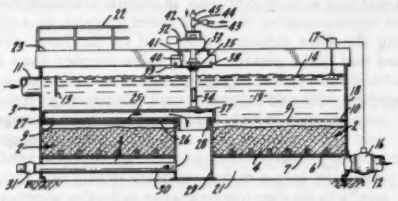
wherein said switches are operated by protrusions provided on the top end of said filter plates.

4,082,664

FILTER AND METHOD

Anders Lindstol, Oakville, Canada, assignor to Ecodyne Corporation, Lincolnshire, Ill.

Continuation-in-part of Ser. No. 699,775, Jul. 22, 1976, abandoned. This application Jun. 2, 1977, Ser. No. 802,927
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—80 57 Claims



8. A multibed liquid filter comprising a container having an inlet and an outlet, means in said container supporting filter material and defining therebeneath a filtered liquid chamber communicating with said outlet, a wall of said container extending above said filter material so as to define a chamber for unfiltered liquid, partitions extending upwardly from said material supporting means so as to divide said filter material into a plurality of beds, the upper terminal edge of each partition extending above said beds into said unfiltered liquid chamber, said upper edges providing sealable surfaces, a backwash isolation hood for sealing with the sealable surfaces provided by the partitions which define any of said beds, a backwash outlet connected to the underside of said hood, means for moving said hood from one bed to another, means connecting the underside of said hood to a source of pressurized gas for floating said hood out of sealing engagement with said partitions, and means for venting the underside of said hood so as to release gas pressure and cause said hood to move into sealing engagement with said sealing surfaces.

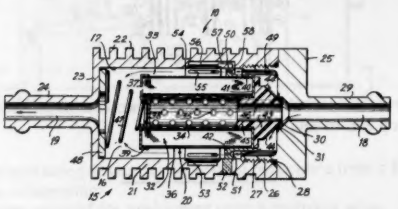
17. A process for filtration of a liquid in a multiunit filter having a movable hood that isolates individual filter units during backwashing, comprising: passing liquid through said units until at least one unit requires backwashing, moving said hood into sealing engagement isolating said unit in need of backwashing from the other units, backwashing said unit by flowing backwashing liquid therethrough, forcing gas under pressure between said hood and unit so as to evacuate sufficient liquid from between said hood and unit to cause said hood to float above said unit and out of sealing engagement therewith, and moving said hood to another unit in need of backwashing.

4,082,665

FLUID FILTER DEVICE FOR AUTOMOTIVE POWER STEERING SYSTEM

Manuel Schneider, 231 Beach 131 St., Belle Harbor, N.Y. 11694, and Emil J. Novak, 111 Stewart Ave. West, Garden City, N.Y. 11530

Filed Jul. 1, 1976, Ser. No. 701,818
Int. Cl.[2] B01D *27/10*
U.S. Cl. 210—91 **26 Claims**



1. A fluid filter device comprising a casing defining a chamber with a cylindrical wall surface and having an axial inlet passage terminating in an opening into said chamber at one end of the latter with a valve seat extending around said opening, and an axial outlet passage extending from said chamber at the opposite end of the latter; an elongated filter element axially movable in said chamber and including a foraminous cylindrical side wall constituting a primary filter and being spaced from said wall surface to provide an annular clearance therebetween communicating with said outlet passage, an end wall closing the filter element at the end of the latter directed toward said outlet passage, and a valve member fixed at the end of said filter element directed toward said inlet passage for engagement with said valve seat, said valve member having an axial bore through which fluid from said inlet passage can enter said filter element for normal filtration through said foraminous side wall while said valve member is engaged with said valve seat; spring means yieldably urging said filter element axially in the direction to engage said valve member with said valve seat, the force of said spring means being selected to be overcome for unseating said valve member and permitting by-passing of said primary filter when clogging of said foraminous side wall results in a predetermined buildup in the pressure differential between fluid entering at said inlet passage and fluid exiting at said outlet passage; and a secondary filter annulus extending around said filter element adjacent the end of the latter at which said valve member is fixed and slidably engaging said wall surface of the chamber so that, upon said unseating of the valve member due to clogging of said foraminous side wall, the fluid bypassing said primary filter is further filtered by said secondary filter annulus in flowing from said inlet passage to said outlet passage by way of said annulur clearance.

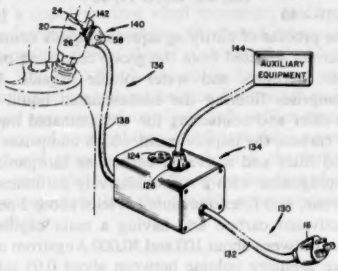
4,082,666

END POINT QUALITY CONTROL LIGHT CIRCUIT

Charles L. Jones, and Dominic Aradio, both of El Paso, Tex., assignors to Continental Water Conditioning Corporation, El Paso, Tex.

Filed Aug. 20, 1976, Ser. No. 716,150
Int. Cl.[2] C02B *1/76*
U.S. Cl. 210—93 **32 Claims**

1. An apparatus for indicating the end point quality of a liquid such as water wherein the liquid is generally non-conductive when of a high quality and becomes more conductive when its quality falls, the apparatus comprising: first and second conductive probe means spaced apart from one another, and adapted to reside within said liquid; excitation means for applying electrical energy across said first and second probe means; isolation means for electrically isolating said excitation means from said probe means; sensor means for sensing the conductivity of said liquid by monitoring current flow between said first and second probe means; means for developing an electrical indicator signal representative of the conductivity of said liquid; threshold means for developing an electrical threshold signal; comparator means for comparing said indicator signal to said threshold signal and for issuing one or the other of two output signals depending upon the magnitude of



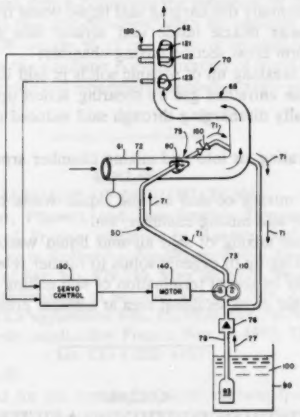
said indicator signal relative to said threshold signal; indicator means having two states, one of which indicates acceptable liquid quality, and the other of which indicates unacceptable liquid quality; and switch means responsive to the output signals issued by said comparator means for switching said indicator means between said two states depending upon the output signal issued by said comparator means.

4,082,667

PROPORTIONING SYSTEM

William Seiler, Jr., Van Nuys, Calif., assignor to David Kopf Systems, Tujunga, Calif.

Filed Oct. 11, 1977, Ser. No. 841,103
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—96 M **1 Claim**



1. In a proportioning system used in an artificial kidney machine for mixing concentrate stored in a concentrate storage jug with water in predetermined proportions having a first conduit through which concentrate flows at a controlled pressure, a second conduit through which water flows, the surface of said first conduit having an orifice through which a portion of said concentrate flowing through said first conduit is discharged into said second conduit at a mixing point with the remainder of said concentrate continuing to flow in said first conduit past said orifice, and control means cooperating with said measuring means for controlling the rate at which concentrate passes through said orifice, thereby maintaining the de-

sired mix proportions of water and concentrate, the improvement comprising:

a recirculation loop formed by said first conduit,

a concentrate supply line connecting said concentrate storage jug with said recirculation loop, and

a check valve in said concentrate supply line which opens at a predetermined pressure in said recirculation loop, whereby concentrate flows from said concentrate storage jug to said recirculation loop when said check valve opens.

4,082,668

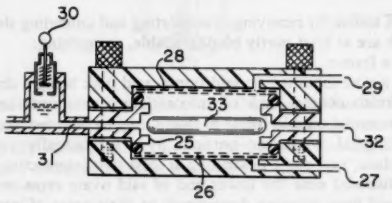
ULTRA FILTRATION APPARATUS AND METHOD

Rashid Ayoub Zeineh, 5742 W. Dakin St., Chicago, Ill. 60634, and Richard Arthur Finley, 2306 E. Honeysuckle Ct., Lindenhurst, Ill. 60046

Filed Sep. 4, 1973, Ser. No. 394,260

Int. Cl.² B01D *13/00*

U.S. Cl. 210—129 **6 Claims**



1. An instrument for ultrafiltration of proteins and macromolecules in solution comprising a unit of three parts including upper, middle and lower elements secured together by retaining means, said upper part comprising a membrane holder having a membrane filter, a porous disc support and an outlet for ultrafiltrate, said middle part including a magnetic stirrer bar assembly and having sample inlet and outlet ports, said lower part comprising a second membrane holder having a second membrane filter and a second porous disc and a second ultrafiltrate outlet port, said magnetic stirrer bar being driven to rotate by means of an external motorized magnetic bar under the lower element, said magnetic stirrer bar being located in proximity to the two said membrane filters but out of contact therewith during rotation of the stirrer bar, and sealing means between said middle part and said membrane filters, said membrane filters being of relatively large diameter and spaced relatively close together separated by said middle part.

4,082,669

SEPARATOR OF OIL AND WATER

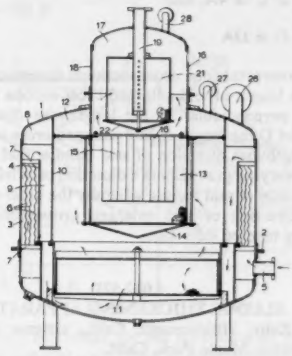
Cuthbert Angus Bainbridge, Birmingham, England, assignor to Barton Hydraulic Engineering Company Limited, Birmingham, England

Filed Jul. 6, 1976, Ser. No. 702,464

Int. Cl.² B01D *21/00*

U.S. Cl. 210—184 **5 Claims**

1. A separator for oil and water in which an oil and water mixture is caused to flow successively through a plurality of separating stages adapted to separate from the water oil particles of progressively decreasing size, wherein the separator comprises a cylindrical vertical container housing the successive separating stages in concentric chambers defined by the wall of the container and internal annular partitions, each chamber having at its upper end a collecting zone for separated oil, a first separating stage comprising a plurality of annular radially spaced shells of which at least portions are inclined to the verticle and which are located in an annular chamber open at the top and bottom between the wall of the container and a concentric partition and means for feeding liquid to be treated to the lower end of said chamber, a second separating stage comprising a coagulator located adjacent to the lower end of said container, means for directing liquid leaving the upper end of said annular chamber of the first stage to the lower end of said coagulator, a third separating stage comprising a filter located within an annular foraminous screen above said coagulator, said screen being in direct communication with the upper end of said coagulator and being fine enough to remove from



the water leaving the second stage oil of molecular dimensions, a central chamber in direct communication with the upper end of said filter, means for withdrawing clean water from the upper end of said central chamber above said filter and means for drawing off oil from said collecting zones at the upper ends of said concentric chambers.

4,082,670

HOLLOW FIBER PERMEABILITY APPARATUS

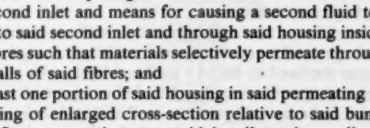
Yasushi Job, c/o Nippon Zeon Co., Ltd. 2-6-1 Marunouchi, Chiyoda-ku, Tokyo, Japan

Filed Jan. 29, 1976, Ser. No. 653,351

Claims priority, application Japan, Feb. 1, 1975, 50-13563; Feb. 15, 1975, 50-19355; Mar. 10, 1975, 50-28845; Jun. 20, 1975, 50-76355; Oct. 29, 1975, 50-130201

Int. Cl.² B01D *31/00*

U.S. Cl. 210—195 R **33 Claims**



1. A hollow-fibre permeability apparatus, comprising:

a housing defining an interior including a permeating region;

a bundle of permeable-wall hollow fibres disposed at least in said permeating region of said housing;

a first inlet and means for causing a first fluid to flow into said first inlet and through said housing adjacent the exterior wall surfaces of said fibres;

a first outlet for passage of said first fluid out of said housing;

a second inlet and means for causing a second fluid to flow into said second inlet and through said housing inside said fibres such that materials selectively permeate through the walls of said fibres; and

at least one portion of said housing in said permeating region being of enlarged cross-section relative to said bundle to define a space between said bundle and a wall of said housing into which at least part of said first fluid passes during its passage from said first inlet to said first outlet, the width of said enlarged cross-section portion being substantially co-extensive with the width of said housing whereby the bundle is exposed across its width to fluid in said enlarged cross-section portion, and across a section of

its length determined by the length of said enlarged cross-section portion, the shape of said enlarged cross-section portion promoting cross-flow of said first fluid relative to the length of said fibres, said shape of said enlarged cross-section portion being formed in accordance with the following formula:

$\frac{1}{4} A \leqq L \leqq 4A$, and

$A \leqq D \leqq 12A$

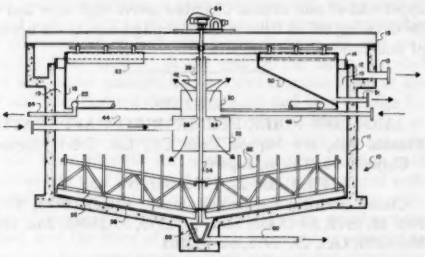
where A represents one cross-sectional dimension of said bundle, L the length of said enlarged cross-section portion in the direction perpendicular to the lengthwise direction of said bundle, and D the length of said enlarged cross-section portion in the lengthwise direction of said bundle, said length L and length D varying gradually in a direction parallel to the lengthwise direction of said bundle whereby the cross-section in said parallel direction of said enlarged cross-section portion is defined by tapered side walls.

4,082,671

SLUDGE THICKENING APPARATUS

Earl M. Kelly, Hillsborough, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Sep. 30, 1976, Ser. No. 728,480
Int. Cl.[2] C02B *3/00*
U.S. Cl. 210—195 S **10 Claims**



1. An apparatus for the concomitant treatment of primary and secondary sewage sludges comprising:

a. a tank having an open top and generally upstanding sidewall to contain a body of liquid;

b. an upper feedwell mounted in said tank and first feed means connected in liquid flow communication with said upper feedwell for introducing aerated secondary sludge thereinto for distribution by said upper feedwell into said tank, said upper feedwell being an upright tubular means open at its top and closed at its bottom;

c. a lower feedwell mounted in said tank below said upper feedwell and second feed means connected in liquid flow communication with said lower feedwell for introducing primary sludge thereinto for distribution by said lower feedwell into said tank below the aerated secondary sludge introduced through said upper feedwell, said lower feedwell being an upright tubular means closed at its top and open at its bottom;

d. a continuous, upstanding partition wall mounted in said tank generally concentric and radially outward of said upper feedwell to define a confined liquid zone surrounding said upper feedwell and to define a generally annular space between said partition wall and said tank sidewall;

e. means mounted on said sidewall for drawing liquid from the surface of the body of liquid contained in said annular space to maintain a predetermined liquid level in said tank;

f. float collection means mounted within said confined liquid zone for collecting solids floating on the surface of the liquid within said confined zone; and

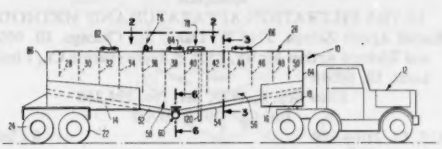
g. sediment collection means connected in communication with the bottom of said tank for collecting and discharging sediment from said tank.

4,082,672

MOBILE SLUDGE TRAILER AND METHOD OF FILLING AND EMPTYING SAME

Alex Petroski, Springfield, Pa., assignor to Liquid Removal Service Co., Inc., Broomall, Pa.

Filed Aug. 16, 1976, Ser. No. 714,973
Int. Cl.[2] C02C *1/02, 3/00*
U.S. Cl. 210—205 **5 Claims**



1. A trailer for receiving, transporting and unloading sludges which are at least partly biodegradable, comprising:

(a) a frame;

(b) a tank mounted on said frame, said tank being a double-frusto conical tank of substantially ovate cross-section mounted on said frame so that it may be bisected into two bilateral symmetric portions by a substantially vertical plane; said plane describing at least two intersecting lines disposed near the lower end of said ovate cross-section, said lines slopping downwards to their point of intersection, and said discharge means being disposed substantially at the point of intersection of said lines, said tank further comprising a substantially planar floor extending along said lines for the entire length of said tank and a plurality of parallel, substantially circular ring-shaped baffles disposed within said tank, said baffles extending from the top peripheral edge of said tank around said tank to points substantially parallel and spaced apart from said floor and having straightened lower edges parallel to said floor extending between said points to form at least one discharge chute defined between said baffles, opposing portions of the walls of said tank and said floor;

(c) loading means for introducing sludge into said tank;

(d) discharge means disposed at the bottom of said tank for allowing sludge to discharge from said tank;

(e) pressurization means for pressurizing the head space of said tank to thereby increase the pneumatic and hydraulic pressure at said discharge means to facilitate more efficient discharge of the sludge therefrom; and

(f) ejection means for ejecting fluid into said tank at the point of intersection of said tank and said discharge means, said ejection means injecting fluid under pressure into said tank toward said discharge means in the direction of discharge of sludge through said discharge means whereby said sludge is entrained in said fluid for discharge through said discharge means.

4,082,673

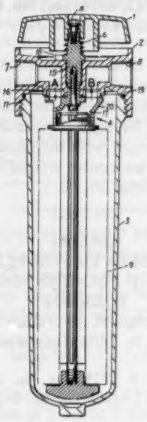
FILTER ASEMBLY WITH INTEGRAL SERVICE SHUT-OFF VALVE

Guido D. Cilento, Dryden, N.Y., assignor to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 477,720, Jun. 10, 1974, abandoned. This application May 30, 1975, Ser. No. 582,568
Int. Cl.[2] B01D *27/00*
U.S. Cl. 210—234 **9 Claims**

1. A filter assembly for use in in-line fluid flow applications including: a filter body having a closure portion associated therewith; fluid inlet means; fluid outlet means; each of said means being integral of said closure portion; handle means affixed to and communicating with said closure portion, said

handle means being movable in concert with valve means disposed between said inlet and outlet means, said valve means being positioned in cooperative working relation with respect



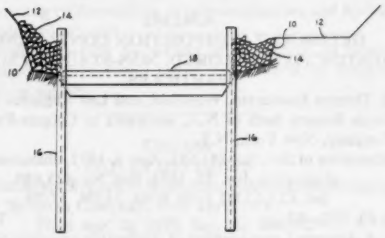
to said closure to thereby control the flow of fluid into said body member by rotation of said handle means; and vent means integrally formed of said closure portion for releasing internal pressure entrapped in said assembly.

4,082,674

BUOY TYPE OIL GATE

Francis J. Dalli, Old Bedford Rd., Lincoln, Mass. 01773

Filed Apr. 30, 1976, Ser. No. 681,981
Int. Cl.[2] B01D *17/02*
U.S. Cl. 210—242 S 6 Claims



1. A buoy type oil gate for a body of water channeled at its sides and bottom and having variable levels and flow comprising

channel means secured at the sides of the body of water, and

floatable means extending thereacross into said channel means and also extending above and below the surface of said body of water,

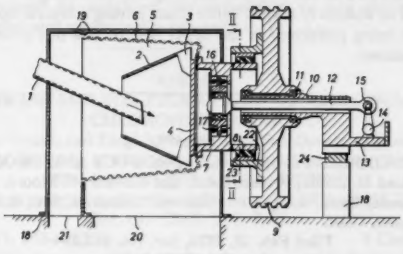
the ends of said floatable means in engagement with said channel means having the downstream portion thereof in a sealing engagement over an area with said channel means due to the pressure of the flow of said stream against said floatable means, said ends being trimmed to reduce friction in said channels for facile movement in the vertical plane while inhibiting freezing of said floatable means to said channels.

4,082,675

VIBRATING CENTRIFUGE

Wolfgang Heckmann, Bergisch-Gladbach, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Aug. 9, 1972, Ser. No. 279,237
Claims priority, application Germany, Aug. 14, 1971, 2140841; Jun. 15, 1972, 2229114
Int. Cl.[2] B01D *33/02*
U.S. Cl. 210—360 R 10 Claims



1. A vibrating centrifuge for the separation of water from finely grained material comprising in combination:

a rotatable centrifugal basket oscillatable in an axial direction;

a rotary drive for the basket;

an oscillating drive connected to the basket for driving in oscillatable axial motion;

an annular support body holding the centrifugal basket;

a drive sleeve connected to the rotary drive concentrically surrounding the annular support body;

a plurality of thrust springs arranged circumferentially and extending radially between said support body and said drive sleeve for elastic connection therebetween;

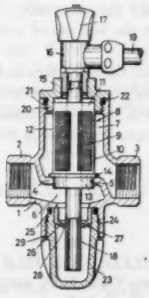
and adjusting elements for the thrust springs adjusting the radial height of the thrust springs and pretensioning the springs radially and operative to change the spring tension in a radial direction for assembly purposes.

4,082,676

DIRT FILTER FOR WATER PIPES

Viktor Dulger, Ludolf-Krehl-Strasse, 8 Heidelberg, Germany (6900)

Filed Mar. 16, 1977, Ser. No. 778,034
Claims priority, application Germany, Apr. 10, 1976, 2615922
Int. Cl.[2] B01D *35/02*
U.S. Cl. 210—447 3 Claims



1. A dirt filter for water pipes defining a housing with lower and upper chambers having an inlet and an outlet respectively, a dividing wall with an opening therein separating said chambers, a lid closing the upper side of said upper chamber, said lid having a cylindrical collar with outer threads, a dirt collecting

container below said lower chamber and having outer threads at its upper part, said housing defining internally threaded collars for threaded connection with said lid and said container, a cylindrical filter insert in said upper chamber having a carrier with an upper ring in sealing engagement with said collar of said lid and a lower ring engaging said dividing wall, the interior of said filter insert being in fluid communication with said lower chamber, said housing defining a dirt egress opening in its lower wall providing fluid communication between said lower chamber and said dirt collecting container, and an annularly shaped baffle insert having a central opening and being positioned in the upper part of said dirt collecting container.

4,082,677

DRIED PHOSPHORIC ACID PRODUCT AND PROCESS

Leland H. Zollar, Fresno, Calif., and Edward W. Moore, Frontenac, Kans., assignors to Harvest Industries, Inc., Los Angeles, Calif.

Filed Feb. 25, 1974, Ser. No. 445,274
Int. Cl.[2] C09K *7/00*
U.S. Cl. 252—8.5 B **30 Claims**

1. A process of producing a dehydrated phosphoric acid compound comprising mixing an aqueous phosphoric acid solution and an absorbent organic carrier, dehydrating the mix, to form a dry, dehydrated phosphoric acid compound, and recovering the dried compound.

4,082,678

FABRIC CONDITIONING ARTICLES AND PROCESS

Hans Joachim Pracht, Osthofen, Germany, and Louis Fay Wong, Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 10, 1976, Ser. No. 740,441
Int. Cl.[2] D06M *13/46*
U.S. Cl. 252—8.6 **25 Claims**

1. A fabric conditioning article especially designed for conditioning fabrics in a clothes washer comprising:

(A) a closed receptacle, at least a part of one wall of said receptacle comprising a water soluble/dispersible material;

(B) an effective amount of a fabric conditioning composition, said composition being contained within the receptacle of (A);

(C) an amount of an agent selected from the group consisting of electrolytes, pH control agents and mixtures thereof sufficient to make the receptacle of (A) water insoluble-/indispersible in the volume of wash water in which it is used; and

(D) a second closed, flexible receptacle, at least a part of one wall of said receptacle comprising a water soluble/dispersible or porous, water insoluble/indispersible material, said second receptacle enclosing the receptacle of (A) and component (C).

4,082,679

LIGHT STABILIZED TEXTILE MINERAL OIL

Rufus K. Rhodes, New York, N.Y., assignor to Witco Chemical Corporation, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,158
Int. Cl.[2] D06M *13/34*
U.S. Cl. 252—8.8 **18 Claims**

1. A light stabilized mineral oil comprising, a technical white mineral oil and from 50 to about 250 ppm of a 2-aryl -4,5 arylo-1,2,3-triazole.

4,082,680

GEAR OIL COMPOSITIONS

Bill Mitacek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 12, 1976, Ser. No. 676,260
Int. Cl.[2] C10M *1/19*
U.S. Cl. 252—59 **5 Claims**

1. Shear-stable, gear oil compositions comprising a mineral lubricating oil containing a shear-stabilizing amount of a soluble hydrogenated butadiene-styrene copolymer dissolved therein, said copolymer having a butadiene content of about 30 to about 44 weight percent with the remainder being styrene and a weight average molecular weight within the range of from about 12,000 to about 20,000.

4,082,681

MAGNETIC DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Hiroshi Takayama, Moriguchi, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company, Osaka, Japan

Filed Nov. 4, 1975, Ser. No. 628,823
Int. Cl.[2] G03G *9/08, 9/14*
U.S. Cl. 252—62.1 P **21 Claims**

1. A developer for electrostatic photography consisting essentially of a dry blend of

(A) substantially spherical particles of a composition comprising a binder resin and a fine powder of a magnetic material dispersed in the binder resin so that the magnetic material is distributed predominantly in the surface layer of the spherical particles to form a crater-like rough surface; and

(B) a finely divided solid conducting agent comprising electrically conductive carbon black and having a particle size smaller than 1/10 of the size of the spherical particles (A), the solid conducting agent being stuck to spherical particles (A) through the crater-like rough surfaces thereof without being embedded by the dry blending of spherical particles (A) and solid conducting agent (B), and being present in an amount of up to 2% by weight, based on spherical particles (A), the dry blend having a volume resistivity of not higher than 1×10^{11} Ω-cm.

4,082,682

DETERGENT COMPOSITION CONTAINING DISTINCTIVE, COLORED, NON-STAINING SOAP PARTICLES

Jack Thomas Inamorato, Westfield, and Leo Augustus Salmen, North Bergen, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 241,515, Apr. 6, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,650
Int. Cl.[2] C11D *3/40, 9/44, 13/08, 17/06*
U.S. Cl. 252—92 **7 Claims**

1. A detergent composition of distinctive appearance which comprises from 90 to 99.7% of substantially round unidimensional detergent particles which have particles sizes within the range of 0.1 to 1 mm in diameter, said detergent particles being white or lightly colored, and comprising from 5 to 40% of synthetic organic anionic detergent, 2 to 20% synthetic nonionic organic detergent, 10 to 50% of water softening builder salt selected from the group consisting of alkali metal polyphosphates, alkali metal silicates, alkali metal carbonates, alkali metal borates, alkali metal bicarbonates, citrates, diglucolates, gluconates, ethylene diamine tetracetates and nitrilodiacetates, 1 to 50% of a filler salt selected from the group consisting of sulfates, citrates, gluconates, carbonates and borates, 0 to .20% moisture and 0.25% of adjuvants; and from 0.3 to 10% of elongated soap particles having diameters in the range of 0.4 to 1.6 mm and length to diameters ratios within the range of 3:1 to 10:1 and being colored with 0.1 to 2% of a non-substantive

colorant producing in the particle a color of a Munsell chrona greater than 4 and a Munsell value of about 4 to 7 selected from the group consisting of C.I. Acid Blue 80, C.I. solvent Green 7 and mixtures thereof and which comprise over 50% of A C_{16} to C_{18} saturated fatty acid soap and from 3 to 20% of moisture; the builder salt, upon dissolving of such detergent particules in water containing hardness ions, assisting in preventing such hardness from reacting with the soap of the elongated particles, which is slower to dissolve, thereby inhibiting production of soap curd in the wash water and aiding in prevention of colorant from being held to insoluble soap that would otherwise be produced and deposited on materials washed with the detergent.

4,082,683

CLEANING OF HARD SURFACES

Wilhelmus Gerardus Galesloot, Haaften, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Sep. 10, 1976, Ser. No. 722,254

Claims priority, application United Kingdom, Sep. 19, 1975, 38550/75

Int. Cl.² C11D *7/54*

U.S. Cl. 252—105 **4 Claims**

1. A dithionite composition which upon admixture with water forms a solution of pH 5 to 9 consisting essentially of:
   a. 20–60% by weight of a dithionite selected from the group consisting of alkali metal dithionites and zinc dithionites;
   b. 10–50% by weight of a water soluble sulfite selected from the group consisting of alkali metal sulfites and ammonium sulfite;
   c. 5–30% by weight of a metal-complexing agent selected from the group consisting of nitrilotriacetic acid; the alkali metal salts of nitrilotriacetic acid, ethylene diamine tetraacetic acid; the alkali metal salts of ethylene diamine tetraacetic acid; citric acid; the alkali metal salts of citric acid; gluconic acid; the alkali metal salts of gluconic acid;
   d. 0.3–5% by weight of an activator for said dithionite, wherein said activator is selected from the group consisting of OH^-, Cl^-, Br^- or $NO^-{}_2$ substituted benzoquinone; OH^-, Cl^-, Br^- or $NO^-{}_2$ substituted naphthoquinone, and SO_3H^- or OH^- substituted anthraquinone;
   e. 1–15% by weight of a thickening agent in an amount sufficient to result in said composition having a viscosity of about 20 to about 100 centipoises when admixed with water, said thickening agent being selected from the group consisting of derivatives of polysaccharides and hydroxyethylcellulose; and
   f. optionally 0–10% by weight of an anionic or nonionic organic surface active agent, and 0–40% by weight of sodium sulfate.

4,082,684

LIQUID DETERGENT

Pieter Hubertus Kreischer, Schiedam, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 28, 1976, Ser. No. 680,953

Claims priority, application United Kingdom, Apr. 29, 1975, 17789/75

Int. Cl.² C11D *15/04, 3/06*

U.S. Cl. 252—109 **6 Claims**

1. An aqueous, built, liquid detergent composition comprising:
   a. 3 to 12 percent of anionic detergent consisting potassium alkylbenzenesulphonate wherein the alkyl is a 10 to 18 carbon, branched or straight alkyl chain;
   b. 2 to 8 percent of soap consisting of a potassium salt of a fatty acid derived from an 8 to 22 carbon saturated or unsaturated fatty acid or polymer thereof;
   c. 0.5 to 5 percent of nonionic detergent consisting of an alkyleneoxide condensation product of an organic hydrophobic radical;
   d. 0.1 to 2 percent of copolymer consisting of the copolymer of maleic anhydride with a compound selected from the group consisting of vinyl methyl ether, ethylene, and styrene, wherein said copolymer has a specific viscosity of 0.1 to 4.5 as a one percent weight/volume solution of said copolymer in methylethylketone at 25° C.; and
   e. 1 to 25 percent of detergent builder consisting of an alkali metal tripolyphosphate wherein said alkali metal is selected from the group consisting of sodium and potassium; and wherein at least 50 percent of said builder is sodium tripolyphosphate;

wherein said copolymer has been partially esterified with 2 to 250 percent, by weight of said copolymer, of said nonionic detergent and subsequently neutralized.

4,082,685

PROCESS FOR THE PRODUCTION OF ALUMINUM CHLOROHYDROXIDES

Bruno Notari, and Luigi Rivola, both of San Donato Milanese, Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Mar. 27, 1975, Ser. No. 562,782

Claims priority, application Italy, Mar. 28, 1974, 49835/74

Int. Cl.² C01F *7/00, 7/22*

U.S. Cl. 252—187 R **3 Claims**

1. The process of producing aluminum chlorohydroxide represented by the formula: $Al_2(OH)_x Cl_y$ wherein x y range from 1 to 4 and 5 to 2, respectively, which consists in reacting hydrochloric acid with an amount of aluminum oxide or aluminum hydroxide which is equal to or slightly greater than the stroichiometric amount for obtaining aluminum trichloride, in the temperature range of from 160° to 270° C and in the pressure range of from 0.1 to 50 kg/cm².

4,082,686

LIQUID CRYSTAL COMPOSITION

Hiroshi Tatsuta, Neyagawa; Masakazu Fukai, Nishinomiya, and Hiroaki Takahashi, Nagasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

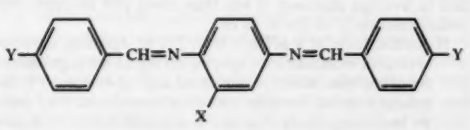
Filed Aug. 4, 1975, Ser. No. 601,343

Claims priority, application Japan, Aug. 6, 1974, 49-90473; Aug. 6, 1974, 49-90474; Sep. 2, 1974, 49-101141; Sep. 11, 1974, 49-105405; Sep. 11, 1974, 49-105406; Nov. 19, 1974, 49-133996

Int. Cl.² C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **5 Claims**

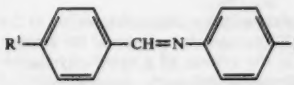
1. A nematic liquid crystal composition comprising at least one of the compounds having the formula,



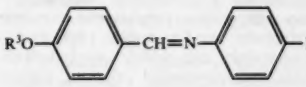
wherein X is methyl and Y is a normal - C_nH_{2n+1} group wherein n is an integer of 2 to 8, and

at leat one of the compounds selected from the group consisting of the compounds having the general formula,

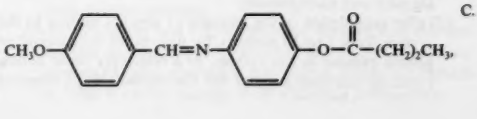
A.



B.



C.



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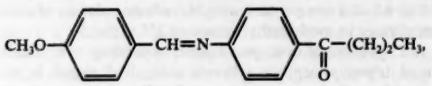
D.



wherein in the compound A, R^1 is an alkyl group having 1 to 3 carbon atoms and R^2 is an alkyl group having 2 to 5 carbon atoms; and in the compound B, R^3 is an alkyl group having 1 to 4 carbon atoms and R^4 is an alkyl group having 3 to 10 carbon atoms.

4,082,687

MANGANESE ACTIVATED ALKALINE EARTH TUNGSTATE PHOSPHORS AND METHOD OF PREPARING THE SAME

Dominic T. Palumbo, deceased, late of Towanda, Pa. (by Frances A. Palumbo, administratrix), and Francis N. Shaffer, Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 9, 1977, Ser. No. 805,002
Int. Cl.[2] C09K *11/38*
U.S. Cl. 252—301.4 F **10 Claims**

1. A luminescent composition consisting essentially of a manganese-activated alkaline earth tungstate represented by the formula, $M_{3+x}WO_{6+x}$: $yMn+4$, wherein M is an alkaline earth metal selected from barium, calcium and strontium, x has a a value of from 0 to about 0.4, y has a value of from about 0.00005 to about 0.05 said luminescent composition emitting deep red emission when excited by long wave length ultraviolet light.

4,082,688

PROCESS FOR PRODUCING MICROCAPSULES

Setsuya Egawa; Masahiro Sakamoto, both of Naka, and Toshihiko Matsushita, Hiratsuka, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 409,110, Oct. 24, 1973, abandoned.
This application Jun. 18, 1976, Ser. No. 697,586
Claims priority, application Japan, Dec. 14, 1972, 47-125738
Int. Cl.[2] B01J *13/02*
U.S. Cl. 252—316 **2 Claims**

1. A process for preparing mononucleic capsules having chemically hardened walls of hydrophilic polymeric material and an average diameter of less than about five microns consisting essentially of the steps of:

(a) establishing, at a pH less than 7.0, an agitating aqueous system of mononucleic capsules having an average diameter of less than about five microns and capsule walls comprising a gelled complex coacervate combination of gelatin and a negatively-electrically charged hydrophilic polymeric material;

(b) adding to the system, once established, from 5 to 10 percent, by weight, of the amount of the gelatin present in the system, of a relatively slow acting chemical hardening agent for the capsule walls selected from the group consisting of formaldehyde, glyoxal, and 2,3-dihydroxy-1,4-dioxane;

(c) after completion of the addition of step (b), adding to the system from 80 to 200 percent, by weight, of the amount of gelatin present in the system, of a negatively-electrically charged hydrophilic polymeric material selected from the group consisting of gum arabic, poly(vinylmethylether-co-maleic anhydride), poly(styrene-co-maleic anhydride), poly(acrylic acid-co-maleic anhydride), poly(vinylacetate-co-maleic anhydride), poly(ethylene-co-maleic anhydride), carboxymethyl cellulose, sodium alginate and carrageenan;

(d) after completion of the addition of step (c), adding to the system from 5 to 10 percent, by weight, of the amount of gelatin present in the system, of a relatively rapid acting chemical hardening agent for the capsule walls selected from the group consisting of glutaraldehyde, acrolein and 2-methylglutaraldehyde; and

(e) after completion of the addition of step (d), raising the pH of the system to greater than 8.0.

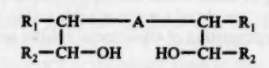
4,082,689

ANTIFOAM COMPOSITIONS AND PROCESS WITH BIS-α-HYDROXYAMINE DERIVATIVES

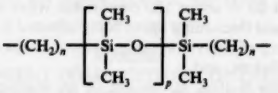
Rudi Heyden, Erkrath; Adolf Asbeck, Dusseldorf; Michael Eckelt, Dusseldorf; Manfred Petzold, Dusseldorf, and Günter Uphues, Dusseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

Filed Dec. 20, 1976, Ser. No. 752,243
Claims priority, application Germany, Dec. 22, 1975, 2558040
Int. Cl.[2] B01D *17/04*
U.S. Cl. 252—321 **17 Claims**

1. A process for the control of foam in a foamable liquid comprising adding to said foamable liquid an antifoam effective amount of a bis-α-hydroxyamine derivative of the formula



wherein A is a member selected from the group consisting of —NHCO—R_3—CONH— and —NHCONH—R_3—NHCONH—, R_1 and R_2 are members selected from the group consisting of hydrogen and alkyl having from 1 to 22 carbon atoms, at least one of R_1 and R_2 being alkyl and the sum of the carbon atoms in $R_1 + R_2$ is from 8 to 22, and R_3 is a bivalent member selected from the group consisting of alkylene having 2 to 10 carbon atoms, phenylene, alkylphenylene having from 1 to 3 carbon atoms in the alkyl and polysiloxane of the formula



where n is an integer from 2 to 3 and p is an integer from 2 to 20.

4,082,690

ANTIFOAM PROCESS FOR NON-AQUEOUS SYSTEMS

Kenneth W. Farminer, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Feb. 7, 1977, Ser. No. 766,171
Int. Cl.[2] B01D *19/04*
U.S. Cl. 252—321 **8 Claims**

1. A method for reducing and/or preventing foam in a non-aqueous system which comprises adding to said system a composition consisting essentially of (1) about 30 to 45 percent by weight of a polydimethylsiloxane fluid, (2) about 1 to 5 percent by weight of a siloxane resin composed of $(CH_3)_3SiO_{\frac{1}{2}}$ units and SiO_2 units in which resin the ratio of $(CH_3)_3SiO_{\frac{1}{2}}$ units to SiO_2 units is in the range of 0.4:1 to 1.2:1, and (3) about 50 to 69 percent by weight of a hydrocarbon solvent for said fluid and resin.

4,082,691

ORGANO SILICON/SILICA DEFOAMER COMPOSITIONS

Paul Daniel Berger, Missouri City, Tex., assignor to Witco Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 433,622, Jan. 16, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,480

Int. Cl.[2] B01D *19/04*

U.S. Cl. 252—358 11 Claims

1. A defoamer silica composition comprising about 1–15% of a hydrophobic precipitated silica in a water-immiscible inert liquid carrier, said hydrophobic silica having been rendered hydrophobic by reaction of a hydrophylic precipitated silica in said suspension with a trichloro-organosilane and a dichloro-organosilane, and adding each of said chlorosilanes in an amount in the range of 10–50% based on the silica and in a molecular proportion of 1:1 to 1:5 respectively.

4,082,692

POLYMERIZATION CATALYST

Brian Peter Forsyth Goldie, Cheam, England, assignor to The British Petroleum Company Limited, London, England

Filed Aug. 9, 1976, Ser. No. 712,949

Claims priority, application United Kingdom, Aug. 21, 1975, 34759/75

Int. Cl.[2] C08F *4/02, 4/64*

U.S. Cl. 252—429 B 12 Claims

1. In a process for the production of a supported Ziegler catalyst comprising adding a compound having the general formula $M(OR)_nX_{4-n}$, wherein M is titanium, X is halogen, R is a hydrocarbon radical and $0 \leqq n < 4$, to a fluidized bed of a magnesium-containing Ziegler support material, the improvement of adding from 0.5 to 5.0 moles of alcohol or phenol per gram atom of titanium to the titanium treated support material at a temperature up to about 100° C., and removing excess alcohol or phenol.

4,082,693

CURE MATERIAL FROM LIQUID POLYTHIOPOLYMERCAPTAN POLYMERS FOR DENTAL IMPRESSION TAKING

Henry A. Kessler, Succasunna, and Phyllis Ying, Morris Plains, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 8, 1976, Ser. No. 739,410

Int. Cl.[2] B01J *31/26*

U.S. Cl. 252—430 9 Claims

1. An accelerator composition for setting liquid polysulfide polymer for dental impression comprising in combination 5% to 30% by weight of 2,2′ dithiobisbenzothiazole, 0.05% to 20% by weight of 2-mercaptobenzothiazole, and 20% to 75% by weight of zinc peroxide, the remainder being inert fillers.

4,082,694

ACTIVE CARBON PROCESS AND COMPOSITION

Arnold N. Wennerberg, Chicago, and Thomas M. O'Grady, Chicago Heights, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 644,095, Dec. 24, 1975, abandoned. This application Jun. 16, 1976, Ser. No. 696,634

Int. Cl.[2] B01J *21/18;* C01B *31/08, 31/12*

U.S. Cl. 252—444 6 Claims

1. A process consisting essentially of:

a. substantially dehydrating an agitated combination of solid potassium hydroxide containing between about 2 and about 25 weight percent water and a carbonaceous material comprising coal coke, petroleum coke or a mixture thereof by heating said combination in a weight ratio said hydroxide to said substance between about ½ to 1 and 5 to 1 below about 900° F.;

b. activating the product of (a) by heating between about 1,300° F. and about 1,800° F.; and

c. cooling the product of (b) and removing essentially all the inorganic material therefrom by water washing to form a high surface area active carbon.

5. Active carbon derived from a carbonaceous material comprising coal coke, petroleum coke or mixtures thereof

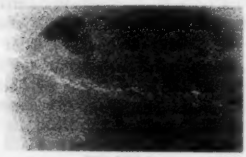
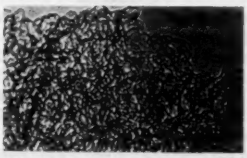


FIG. 1



having a cage-like structure exhibiting microporosity which contributes to over 80 percent of its surface and which has an effective BET surface area of greater than about 2,700 square meters per gram and a bulk density greater than about twenty-five hundredths grams per cubic centimeter.

4,082,695

CATALYST FOR RESIDUA DEMETALATION AND DESULFURIZATION

Edward J. Rosinski, Pedricktown; Thomas R. Stein, and Ronald H. Fischer, both of Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 542,523, Jan. 20, 1975, abandoned, which is a division of Ser. No. 392,730, Aug. 29, 1973, Pat. No. 3,876,523. This application Jul. 22, 1976, Ser. No. 707,790

Int. Cl.[2] B01J *21/04, 23/84, 23/88*

U.S. Cl. 252—465 6 Claims

1. Hydrometalation-desulfurization catalyst comprising: a hydrogenating component comprising the oxides or sulfides of at least one metal selected from the group consisting of Group VI B and Group VIII composited with an alumina base, said alumina base comprising theta or delta phase alumina, and said composite catalyst having not less than about 60% of its pore volume in pores with diameters of about 100A to about 200A, and not less than about 5% of its pore volume in pores greater than 500A in diameter, said composite catalyst being further characterized as having a surface area of less than 110 m^2/g.

4,082,696

METHOD OF CATALYST MANUFACTURE

Delmar W. Robinson, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 603,838, Aug. 11, 1975, abandoned. This application Sep. 23, 1976, Ser. No. 725,801

Int. Cl.[2] B01J *21/04, 23/42, 23/74*

U.S. Cl. 252—466 B 6 Claims

1. A method of catalyst manufacture which comprises:

(a) preparing a calcined tin-containing refractory inorganic oxide carrier material;

(b) impregnating said carrier material with an acid solution of a platinum precursor compound and a cobalt precursor compound, said precursor compounds being convertible to oxide form on heating in an oxidizing atmosphere;

(c) maintaining the impregnated carrier material in an agitated state at a temperature up to about 195° C. over an extended period, and drying said carrier material to a volatile content of not greater than about 12.6 wt. % as determined by weight loss on ignition at 900° C., said extended period being equivalent to at least about 0.5 hours per 100 pounds of impregnated carrier material on a volatile-free basis, and not less than 2 hours; and

(d) heating the dried impregnated carrier material in an oxidizing atmosphere at a temperature of from about 450° to about 675° C. and thereafter in a reducing atmosphere at a temperature of from about 300 to about 675° C.

4,082,697

CATALYST CARRIER, ITS METHOD OF PREPARATION AND A REFORMING CATALYST SUPPORTED ON THE CARRIER

Paul W. Tamm, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 496,788, Aug. 12, 1974, which is a continuation-in-part of Ser. No. 387,100, Aug. 9, 1973, abandoned. This application Aug. 23, 1976, Ser. No. 716,924

Int. Cl.[2] B01J *21/04, 23/60, 23/62, 23/64*

U.S. Cl. 252—466 PT 15 Claims

1. A method for preparing a porous catalyst carrier which comprises:

(a) treating a peptizable particulate solid comprising predominantly alpha-alumina monohydrate sized in the range below about 500 microns by admixing the solid with an aqueous solution of at least one acid selected from the group consisting of nitric, hydrochloric, hydrofluoric and hydrobromic acids, said solution containing an amount of the acid in the range from about 0.02 ot 0.20 equivalent per formula weight of the alumina;

(b) neutralizing at least a portion of the admixed acid by admixing into the treated solid an aqueous solution of a nitrogen base selected from the group of the formula R_3N and the corresponding hydroxide R_3HNOH, wherein said R groups are the same or different and are selected from the group consisting of hydrogen and of alkyl groups having a carbon atom content in the range from 1 to 3, inclusive, said solution containing an amount of the base in the range from about 0.1 to 1.2 equivalents per equivalent of said acid;

(c) shaping the neutralized or partially neutralized solid; and

(d) drying and calcining the shaped solid in a dry or humid atmosphere at a temperature in the range from about 150° to 1700° F, said dried and calcined carrier having (1) a pore volume of at least 0.5 cc/g, (2) a content of micropores in the range between about 80 and 150 A in diameter constituting at least 70% of said pore volume, and (3) a content of pores having a diameter greater than 1000 A constituting from about 0.1 to less than 3% of said pore volume, said pore-sizes corresponding to sizes determined by the mercury porosimetry method.

4,082,698

CATALYST COMPOSITIONS ESPECIALLY USEFUL FOR PREPARATION OF UNSATURATED ACIDS

Wilfrid G. Shaw, Lyndhurst, and David B. Terrill, Bedford Height, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 646,224, Jan. 2, 1976, Pat. No. 4,051,180. This application Jul. 26, 1976, Ser. No. 708,812

Int. Cl.[2] B01J *23/16, 23/22, 23/28, 23/72*

U.S. Cl. 252—469 3 Claims

1. A catalyst composition having the empirical formula:

$$Mo_aV_bCu_cX_dO_e$$

wherein X is a metal selected from the group consisting of antimony or the combination of antimony and germanium, and wherein

a is a number from 6 to about 18;

b, c, and *d* each are about 0.1 to about 6; and

e is the number of oxygens required to satisfy the valence requirements of the other metals present.

4,082,699

METHOD OF PREPARING CATALYTIC STRUCTURES FROM COLLOIDAL PLATINUM COMPOUNDS AND SUCH CATALYTIC STRUCTURES

Henry G. Petrow, Watertown, and Robert J. Allen, Saugus, both of Mass., assignors to Prototech Company, Newton, Mass.

Continuation-in-part of Ser. No. 535,031, Dec. 20, 1974, Pat. No. 3,992,331, and a continuation-in-part of Ser. No. 534,731, Dec. 20, 1974, Pat. No. 4,044,193. This application Sep. 22, 1976, Ser. No. 725,428

Int. Cl.[2] B01J *23/42*

U.S. Cl. 252—472 7 Claims

1. In the method of preparing a catalytic structure suitable for high temperature operation, the steps of oxidizing the ligand of an oxidizable-ligand-containing complex platinum compound by adding thereto an aqueous solution of a non-complexing oxidant to produce a colloidal platinum-containing sol; applying said sol to a substrate so that the particles of the substrate act both as nuclei and as mechanical support for the colloidal particles of the applied sol; and reducing the colloidal particles on said substrate, thereby depositing platinum metal particles uniformly throughout the surface of the substrate as a result of such nucleation.

4,082,700

VULCANIZABLE RUBBER COMPOSITIONS AND VULCANIZED RUBBERS OBTAINED THEREFROM

Masao Onizawa, Kunitachi, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1975, Ser. No. 625,106

Claims priority, application Japan, Oct. 29, 1974, 49-124032

Int. Cl.[2] C08G *65/32;* C08J *3/24;* C08K *5/09*

U.S. Cl. 260—2 A 2 Claims

1. A vulcanizable composition which comprises (1) an epichlorohydrin rubber selected from the group consisting of an epichlorohydrin homopolymer, a copolymer of epichlorohydrin and ethylene oxide, a copolymer of epichlorohydrin and allylglycidyl ether, and a copolymer of epichlorohydrin, ethylene oxide and allylglycidyl ether, and (2) 0.01 to 50 parts by weight per 100 parts by weight of the epichlorohydrin rubber of at least one amino acid selected from the group consisting of arginine, lysine, hydroxylysine, ornithine, asparagine, glutamine and citrulline.

4,082,701

SUGAR DECOLORIZING QUATERNARY AMMONIUM ACRYLAMIDE RESINS

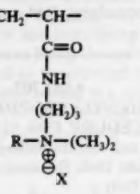
William Fries, Southampton, and Silvia Napierski, Elkins Park, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 615,144, Sep. 9, 1975, abandoned. This application May 13, 1977, Ser. No. 796,590

Int. Cl.[2] C13D *3/14*

U.S. Cl. 260—2.1 E 18 Claims

1. A crosslinked, macroreticular, quaternary ammonium acrylamide resin which comprises the product from the reaction of a compound of the formula RX with a crosslinked, macroreticular tertiary amine, acrylamide precursor resin which comprises a copolymer of 0.1% - 50% by weight of a polyethylenically unsaturated monomer and 50% - 99.9% by weight of a monoethylenically unsaturated aliphatic ester of acrylic acid which has been aminolyzed with a polyamine, said resin comprising units having the chemical formula:



wherein R is a substituted or unsubstituted hydrocarbyl functional group containing 5 - 22 carbon atoms and $X\ominus$ is an anion.

4,082,702

FLAME RETARDANT RIGID POLYURETHANE SYNTACTIC FOAM

Jack R. Harper, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 614,465, Sep. 18, 1975, abandoned. This application Mar. 1, 1976, Ser. No. 662,384

Int. Cl.[2] C08G *18/14*

U.S. Cl. 260—2.5 AK **15 Claims**

1. A rigid polyurethane syntactic foam consisting of a cured product obtained from a mixture consisting essentially of the composition obtained by mixing an organic polyol, a polyisocyanate, microballoons, a catalyst for the reaction between the organic polyol and polyisocyanate, and a substantially colorless, compatible flame retardant having a viscosity less than 100 centipoise at 23.9° C., having a volatility such that the flame retardant does not evaporate from the exotherm generated by reacting ingredients and said flame retardant is nonreactive in the mixture to the extent that the physical properties of the foam are not substantially changed compared to the physical properties of the foam without the flame retardant present, a combination of the organic polyol and the polyisocyanate being a liquid at 25° C., there being present in the mixture a sufficient amount of microballoons to provide a non-castable mixture in the absence of the flame retardant and the amount of flame retardant present in the mixture being sufficient to provide a castable mixture which will flow in a mold cavity to the extent that mold details are filled, and the mixture cures to a rigid polyurethane syntactic foam which is flame retardant.

4,082,703

POLYURETHANE PREPOLYMERS, REBONDED POLYURETHANE FOAM AND METHODS OF FORMING THE SAME

Robert Donovan Duffy, Summersville, and Eldon Charles Stout, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 565,950, Apr. 7, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,808

Int. Cl.[2] C08G *18/14, 18/48, 18/76*

U.S. Cl. 260—2.5 BE **21 Claims**

1. A polyurethane prepolymer consisting of the reaction product of (a) an isocyanate selected from the group consisting of tolylene diisocyanate, tolylene diisocyanate residue, diphenylmethane diisocyanate, polymethylene poly(phenyleneisocyanates), and blends thereof and (b) a polyoxyalkylene polyol having an oxyethylene content of from about 30 to 100 percent by weight, the oxyalkylene groups in the polyol being oxyethylene groups or oxyethylene groups and oxypropylene groups and said prepolymer having a free NCO content of from about 2 to 20 percent by weight, with the proviso that when the oxyethylene content of the polyol is 100 percent by weight the isocyanate is other than tolylene diisocyanate or diphenylmethane diisocyanate and with the further proviso that the prepolymer is a homogeneous solution except when the diisocyanate is diphenylmethane diisocyanate.

14. A rebonded polyurethane foam comprising a block of foam particles having dimensional stability and said particles being bonded together by a cured polyurethane prepolymer, said prepolymer consisting of the reaction product of (a) an isocyanate selected from the group consisting of tolylene diisocyanate, tolylene diisocyanate residue, diphenylmethane diisocyanate, polymethylene poly(phenyleneisocyanates), and blends thereof and (b) a polyoxyalkylene polyol having an oxyethylene content of from about 30 to 100 percent by weight, the oxyalkylene groups in the polyol being oxyethylene groups or oxyethylene groups and oxypropylene groups and said prepolymer having a free NCO content, prior to curing, of from about 2 to 20 percent by weight and being present in an amount of no more than about 6 percent based on the total weight of the block constituent including the prepolymer.

4,082,704

POLYURETHANE FOAM OF INCREASED RIGIDITY

Bernard Rudner, Ridgewood, and Thomas M. Noone, Little Ferry, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jul. 6, 1976, Ser. No. 702,872

Int. Cl.[2] C08G *18/14*; C08J *9/42*

U.S. Cl. 260—2.5 A **10 Claims**

1. A process for the manufacture of a polyurethane foam of increased rigidity which comprises impregnating a flexible polyurethane foam with at least one thermosetting melamine, urea or benzoguanamine resin and at least one cross-linker selected from the group consisting of polycarboxylic acids which contain at least three carboxyl groups, and polyanhydrides which contain at least two carboxylic acid anhydride groups per molecule, and then reacting the resin with the cross-linker.

10. The foam of increased rigidity produced in accordance with the process of claim 1.

4,082,705

PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Charles H. Beede, and Theodore Blumig, both of East Brunswick, N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

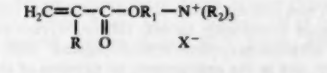
Filed Feb. 5, 1976, Ser. No. 655,602

Int. Cl.[2] C08L *33/08, 23/20, 9/00*

U.S. Cl. 260—4 R **8 Claims**

1. An improved pressure sensitive adhesive composition comprising from about 82 to about 97.5 parts by weight of a pressure sensitive adhesive polymer and, correspondingly, from about 2.5 to about 18 parts by weight of a non-tacky, cross-linked, hydrophilic random interpolymer, said interpolymer comprising:

(A) from about 10 to about 90 parts by weight of a monomeric ester of an α,β-olefinically unsaturated carboxylic acid and a monohydric or polyhydric alcohol having a terminal quaternary ammonium group, said ester having the structure:

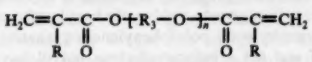


wherein R is selected from the group consisting of hydrogen and C_1 to C_4 alkyl; R_1 is selected from the group consisting of C_1 to C_4 alkylene and hydroxy substituted C_1 to C_4 alkylene; each R_4 is selected from the group consisting of C_1 to C_4 alkyl; and X^- is an anion sufficiently acidic to form a salt with amino nitrogen;

(B) correspondingly, from about 90 to about 10 parts by weight of an α,β-olefinically unsaturated comonomer; and

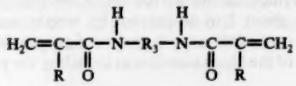
(C) at least 0.02 part by weight of a cross-linking agent comprising a difunctional monomer selected from the esters and amides of α,β-olefinically unsaturated acids

selected from the group consisting of the compounds defined by structural formulas I, II and III below:



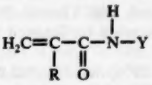
I

wherein R is hydrogen or C_1 to C_4 alkyl; R_3 is C_1 to C_6 alkylene; and *n* is an integer from 1 to 3;



II

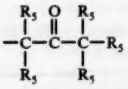
wherein R is hydrogen or C_1 to C_4 alkyl; and R_3 is C_1 to C_6 alkylene; and



III

wherein R is hydrogen or C_1 to C_4 alkyl; and Y is selected from the group consisting of

and



wherein R_4 is selected from the group consisting of hydrogen and C_1 to C_5 alkyl; and each R_5 is selected from the group consisting of hydrogen and $—CH_2OH$; provided, however, that at least one R_5 is $—CH_2OH$;

said comonomer comprising (a) at least 10% by weight of the total weight of monomers (A) and (B) of an acid comonomer or (b) at least 20% by weight of the total weight of monomers (A) and (B) of an amide comonomer, or (C) at least 10% by weight of the total weight of monomers (A) and (B) of a combination of acid and amide comonomers, said combination containing at least 5% by weight of the total weight of monomers (A) and (B) of an acid comonomer.

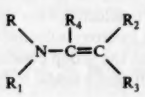
4,082,706

NON-STAINING ANTIOZONANT ENAMINES

Arthur C. Danielson, Royal Oak, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jun. 13, 1975, Ser. No. 586,829
Int. Cl.[2] C08L *7/00*
U.S. Cl. 260—5 **21 Claims**

1. A non-staining white-wall tire stock with improved ozone resistance comprising natural rubber, styrene-butadiene rubber, ethylene-propylene-non-conjugated diene terpolymer rubber, and as the antiozonant, an enamine of the formula



wherein R and R_1 are each primary or secondary, saturated or unsaturated alkyl groups with 1 to 8 carbon atoms, or together with the nitrogen form a cyclic ring structure having 4 to 6 carbon atoms; R_2 and R_3 are each hydrogen, an alkyl group with 1 to 6 carbon atoms, or joined together to form a cyclic ring structure having 5 to 7 carbon atoms; and R_4 is hydrogen or a primary or secondary alkyl group with 1 to 4 carbon atoms.

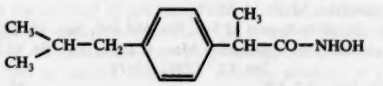
4,082,707

2-(4-ISOBUTYLPHENYL)-PROPIOHYDROXAMIC ACID AND A PROCEDURE FOR ITS PREPARATION

Giovanni Orzalesi, and Renato Selleri, both of Florence, Italy, assignors to Societa Italo-Britannica L. Manetti-H. Roberts & Co., Florence, Italy

Continuation of Ser. No. 428,835, Dec. 27, 1973, abandoned. This application Oct. 26, 1976, Ser. No. 735,525
Claims priority, application Italy, Jan. 8, 1973, 47550 A/73; Jul. 5, 1973, 51249 A/73
Int. Cl.[2] C07C *83/10*
U.S. Cl. 260—500.5 H **1 Claim**

1. The compound 2-(4-isobutylphenyl)-propriohydroxamic acid having the structural formula



4,082,708

ADHESIVE SYSTEMS COMPRISING A BISAMINO PIPERAZINE-CONTAINING POLYAMIDE

Ramesh Mehta, Roseville, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Sep. 20, 1976, Ser. No. 725,012
Int. Cl.[2] C08G *59/44*
U.S. Cl. 260—18 N **18 Claims**

3. A two-part thermosettable epoxy adhesive system comprising a curable epoxy resin and a polyamide curing agent therefor, said system comprising:

in a first part, a liquid curable epoxy resin having an epoxide equivalent weight greater than 60, said curable epoxy resin being capable of being cured with a solid polyamide curing agent when said solid polyamide curing agent is heated to a temperature above its softening point; and

in a second part, a polyamide curing agent for said curable epoxy resin, said polyamide being solid at room temperature and having a softening point above 65° C., said polyamide containing at least 20 mole % terminal groups which are residues of 1,4-bisalkylamino piperazine, said polyamide comprising the residue of a polycarboxylic acid or functional equivalent thereof, linked by amido linkages to the residue of an amine having a plurality of amine groups; said residue of said amine having been derived from a polyamine comprising 20–90 amine equivalent percent of said 1,4-bisalkylamino piperazine; said residue of said polycarboxylic acid comprising the residue of an aliphatic dicarboxylic acid selected from the group consisting of: a dimerized unsaturated fatty acid; a straight-chain, saturated aliphatic dicarboxylic acid; and mixtures thereof.

4,082,709

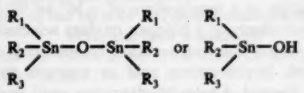
LOW LEACHING ANTIFOULING ORGANOMETALLIC POLYESTERS

Edward J. Dyckman, Sunderland; Jean A. Montemarano, Annapolis, and Eugene C. Fischer, Arnold, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 438,313, Jan. 31, 1974, Pat. No. 3,979,354. This application Jun. 24, 1976, Ser. No. 699,745
Int. Cl.[2] C09D *3/68, 5/14, 5/16*
U.S. Cl. 260—22 CB **17 Claims**

1. A composition of matter for preventing the growth of

fouling organisms on a marine structure, said composition being characterized by a low leaching rate of the antifouling agent from the composition and comprising an organotin containing polymer, said polymer being the reaction product of an unsaturated alkyd resin and an unsaturated compound capable of cross-linking said resin and having as a substituent a carboxylic acid group which has bonded thereto an organotin compound selected from the group consisting of tin oxides and tin hydroxides of the formula:



wherein R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of propyl, butyl, phenyl, and benzyl, and wherein said bonding results from the reaction of said carboxylic acid group with said organotin compound.

4,082,710

ISOCYANATE-MODIFIED ACRYLIC COMPOSITIONS

August Vrancken, Dworp; Paul Dufour, Ruisbroek, both of Belgium; Jacques Noat, Versailles, and Jean Holderic, Asnieres, both of France, assignors to U C B, Societe Anonyme, Brussels, Belgium

Division of Ser. No. 469,891, May 14, 1974, Pat. No. 3,952,032. This application Dec. 3, 1975, Ser. No. 637,480

Claims priority, application United Kingdom, May 15, 1973, 23083/73

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 TN **12 Claims**

1. Isocyanate-modified compounds consisting of the reaction products of an organic isocyanate with compounds with multiple acrylic radicals, the average composition of which corresponds to the formula

$$X—Y—(Z)_{m-p-1}]_n$$

wherein X is the radical derived by removing the OH groups from the carboxyl groups of an organic carboxylic acid containing *n* COOH groups and the number of carbon atoms of which is between 14 and 90,

Y is the radical derived by removing m-p hydrogen atoms from the hydroxyl groups of an organic compound containing *m* OH groups,

Z is the monovalent radical derived by removing the OH group from the carboxyl group of a monocarboxylic acid having at least one terminal $CH_2=CH—COO—$ radical,

n is a whole number from 1 to 6,

m is a whole number from 2 to 8,

p is a number of from 0 to 2.5 and greater than 0, with the proviso that *m-p-1* is a positive number different from zero and that *n(m-p-1)* is between 2 and 15.

4,082,711

SHAPED ARTICLES ON THE BASIS OF VINYL CHLORIDE POLYMERS HAVING AN INCREASED WHITE FRACTURE EFFECT

Hans-Joachim Andrascheck, Burgkirchen, Alz; Otfried Lörcher, Burghausen, Salzach, and Erich Zentner, Burgkirchen, Alz, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 19, 1976, Ser. No. 733,760

Claims priority, application Germany, Oct. 24, 1975, 2547612

Int. Cl.² B29C *17/00*; B31F *23/10*; C08K *5/10, 5/53*

U.S. Cl. 260—23 X A **8 Claims**

1. In the process for the manufacture of shaped articles, especially films or sheets, with a white fracture effect from a molding composition of

(a) a vinyl chloride polymer having at least 50% polymerized vinyl chloride by weight of the total polymer, and

(b) an elastomer of a acrylonitrile/butadiene/styrene, methylmethacrylate/butadiene/styrene or methylmethacrylate/acrylonitrile/butadiene/styrene resin in an amount of from 5 to 25% by weight of the total molding composition, the improvement which comprises adding as plasticizer to said molding composition a phosphoric, phtalic, di- or tricarboxylic, fatty or alkylsulfonic acid ester or an epoxidized oil in an amount of from 3 to 10% by weight of the total molding composition.

4,082,712

PROCESS FOR CURING SULFHYDRYL-TERMINATED THIOETHER POLYMERS

Bobby F. Dannels, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 554,816, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 535,632, Dec. 23, 1974, Pat. No. 3,992,274. This application Dec. 30, 1976, Ser. No. 755,885

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28 R **11 Claims**

1. In the process of preparing a thioether elastomer by reaction of an organic peroxy compound with a liquid sulfhydryl-terminated monosulfide thioether polymer substantially devoid of ethylenic and acetylenic unsaturation having a functionality of 2 to 3 sulfhydryl substituents per molecule which is curable therewith, the improvement which comprises carrying out the reaction in the presence of a curing amount, corresponding to at least about 5 parts by weight per one hundred parts by weight of he liquid thioether polymer, of tertiary butyl perbenzoate as the organic peroxy compound.

4,082,713

PRODUCTION OF A COLOR DEVELOPING RECORD SHEET CONTAINING METAL-MODIFIED NOVOLAK RESIN PARTICLES

Russell D. Kelley, Waverly, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 575,055, May 5, 1975, Pat. No. 4,034,128. This application Mar. 21, 1977, Ser. No. 779,307

Int. Cl.² C08L *61/06*; B41M *5/12, 5/16*

U.S. Cl. 260—29.3 **9 Claims**

1. A rheologically stable aqueous dispersion of metal-modified novolak resin comprising up to about 58% by weight of particles of said metal-modified novolak resin having an average particle size of below about 10 microns, at least about 1.5% by weight based on the weight of said resin particles of an anionic polymeric dispersing agent and at least about 0.2% by weight based on the weight of said resin particles of an organo-phosphorus compound, said organo-phosphorus compound containing two or more phosphonic acid or alkali metal phosphonate groups per molecule.

4,082,714

PROCESS FOR THE EMULSION POLYMERIZATION OF CONJUGATED DIENES

Enzo Lo Scalzo, Milan; Franco Ferré, Gorla Minore (Varese), and Gianfranco Cantoni, Busto Arsizio (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 413,061, Nov. 5, 1973, abandoned. This application Nov. 25, 1975, Ser. No. 635,193

Claims priority, application Italy, Nov. 30, 1972, 32269/72

Int. Cl.² C08L *9/10, 9/02, 9/06*

U.S. Cl. 260—29.7 R **21 Claims**

1. A process for the production of a low viscosity polybutadiene latex by emulsion polymerization, the latex having a solids content of greater than 40%, uniform particle sizes with average diameters being between about 1800 A and 2500 A, the latex exhibiting no gel formation and being formed in the absence of any agglomeration of the polybutadiene, including the steps of

(a) adding butadiene monomer with a chain regulator and an emulsifier to an aqueous reaction medium containing a dispersing agent, said butadiene monomer being added in an amount of about 20 to 40% by weight of the total butadiene monomer employed in the process,

(b) conducting an initial polymerization stage in the presence of the butadiene monomer as a phase separate from the polymer being formed, this initial stage being completed before gel formation begins,

(c) conducting an intermediate state in which butadiene monomer is added in quantities such that the conversion of the butadiene monomer at the end of each individual addition exceeds 45%, the additions occurring when the ratio of monomer to polymer is less than about 0.65:1 but not less than about 0.25:1, and the additions continuing until the polymer concentration in the reaction medium reaches about 50 wt.%, and

(d) conducting a final stage such that the reaction is continued to a conversion of about 75 to 95% of the butadiene monomer.

4,082,715

CRYSTALLIZATION OF POLYCARBONATES

Jean-Pierre Mercier, Kessel Lo Belgique, Belgium, assignor to Unibra S.A., Brussels, Belgium

Filed Nov. 13, 1975, Ser. No. 631,608

Claims priority, application France, Nov. 14, 1974, 74 37546

Int. Cl.[2] C08L *67/00*

U.S. Cl. 260—30.6 R **10 Claims**

1. A moulding composition comprising a polycarbonate polymer from 2.5 to 20% by weight of a plasticizer for said polycarbonate, and from 0.01 to 20% by weight of a finely divided nucleating agent selected from the group consisting of metal salts of polymers carrying lateral carboxylic groups.

4,082,716

HIGH IMPACT POLYPROPYLENE RESINS CONTAINING PHTHALIDE

Ivor R. Fielding, Naperville, and Wassily Poppe, Lombard, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 27, 1976, Ser. No. 652,878

Int. Cl.[2] C08K *5/09*; C08L *23/12, 23/14*

U.S. Cl. 260—30.4 R **10 Claims**

1. A composition having improved impact and flow properties comprising a resinous polymer of propylene containing at least 75 percent by weight propylene and phthalide in a concentration of 0.5 to 15 parts by weight per each 100 parts by weight resinous polymer of propylene.

4,082,717

PREPARATION OF GAMMA-PYRONES

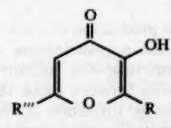
Thomas M. Brennan, Old Lyme; Daniel P. Brannegan, Pawcatuck; Paul D. Weeks, and Donald E. Kuhla, both of Gales Ferry, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 710,901, Aug. 2, 1976, abandoned. This application Sep. 9, 1976, Ser. No. 721,885

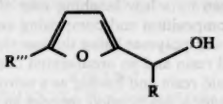
Int. Cl.[2] C07D *309/22*

U.S. Cl. 260—345.9 R **14 Claims**

1. A process for preparing a gamma-pyrone of the formula



which comprises contacting a furfuryl alcohol of the formula



wherein R is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or benzyl and R‴ is hydrogen or alkyl of 1 to 4 carbon atoms in aqueous solution at a temperature of −50° to 50° C with at least two equivalents of a halogen oxidant selected from the group consisting of chlorine, bromine, bromine chloride, hypochlorous acid, hypobromous acid or mixtures thereof and heating the formed 4-halo-dihydropyran until hydrolysis is substantially complete.

4,082,718

TAP HOLE MIX

Teiichi Ando, and Hidenobu Itoi, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 24, 1976, Ser. No. 688,999

Claims priority, application Japan, May 30, 1975, 50-64911; May 30, 1975, 50-64912

Int. Cl.[2] C08K *5/05*

U.S. Cl. 260—33.4 R **7 Claims**

1. In a tap hole mix for a blast furnace composed of refractory materials and a binder, the improvement which comprises said binder consisting essentially of a novolak phenol resin (A) having a mean molecular weight from 200 to 800, a substance which produces formaldehyde by thermal decomposition when subjected to the furnace heat and an alcoholic solvent, the amount of resin being from 3 to 30 percent based on the total mix, the amount of solvent being from 4 to 15 percent based on the total mix, the amount of formaldehyde producing substance being from 0.5 to 10 percent based on the resin and the remainder of the mix being refractory material.

4,082,719

SILICONE EPOXY CURABLE COMPOSITIONS

Donald T. Liles, and Keith W. Michael, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 23, 1976, Ser. No. 660,572

Int. Cl.[2] C08L *63/02, 83/06*; C08G *59/02*

U.S. Cl. 260—37 SB **29 Claims**

1. A substantially anhydrous composition comprising

(A) an organosilicon compound containing at least one silicon-bonded hydroxyl group;

(B) a compound containing an average of more than one epoxy group;

(C) a catalytic amount of an aluminum compound selected from the group consisting of aluminum trihydroxide, aluminum alcoholates, aluminum acylates, salts of aluminum acylates and alcoxides aluminosiloxy compounds and aluminum chelates, and

(D) an organohydriosilicon compound containing at least one silicon-bonded hydrogen atom per molecule in an amount sufficient to provide no more than 0.1 percent by weight silicon-bonded hydrogen based on the combined weight of (A) and (B), said organosilicon compound (A) being present in an amount sufficient to provide at least 0.1 silicon-bonded hydroxy groups per epoxy group present in (B), and said substantially anhydrous composition being curable to a hard resinous material.

4,082,720

PROCESS FOR FORMING POLYMERIC COMPOSITIONS

Terence John Henman, Haslingfield, and Graham Williams, Runcorn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 257,143, May 26, 1976, Pat. No. 4,000,111. This application Oct. 31, 1975, Ser. No. 627,775

Claims priority, application United Kingdom, May 28, 1971, 17712/71; Aug. 27, 1971, 40273/71

The portion of the term of this patent subsequent to Dec. 28, 1993, has been disclaimed.

Int. Cl.[2] C08K *3/24, 7/14, 9/06;* C08L *23/00*

U.S. Cl. 260—42.15 14 Claims

1. A process of forming a polymeric composition by mixing (a) at least one compound which is a carboxylic acid or a carboxylic acid anhydride selected from the group consisting of (I) benzoic acid, (II) lactic acid, (III) polycarboxylic acids which contain not more than four carboxylic acid groups and not more than one atom of an element other than carbon, hydrogen or oxygen in the molecule, and (IV) anhydrides of acids of groups I, II or III, with (b) a graft copolymer of an unsaturated dicarboxylic acid or the anhydride of an unsaturated dicarboxylic acid and a propylene polymer in such proportions that 1 to 90% of the functions

contained in the acid and/or anhydride groups of (a) and (b) are present in the acid or anhydride component of the graft copolymer.

4,082,721

1,4-BIS(1-CYANO-CARBOCYCLIC-UNSATURATER HYDROCARBYL) DYE COMPOSITIONS

Johannes George Jacobus Kok; Rudolf van Moorselaar, and Aart Noordermeer, all of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

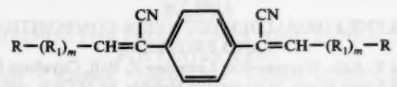
Continuation of Ser. No. 462,760, Apr. 22, 1974, abandoned, which is a division of Ser. No. 264,788, Jun. 21, 1972, abandoned. This application Feb. 3, 1976, Ser. No. 654,751

Claims priority, application Netherlands, Jun. 25, 1971, 7108768

Int. Cl.[2] C08K *5/45, 5/15;* C09D *3/80*

U.S. Cl. 260—42.21 24 Claims

1. A synthetic resin dyed by a compound of the formula



wherein R is phenyl or phenyl substituted with at least one moiety selected from the group consisting of halo, hydroxy, nitro, cyano, alkyl of up to 18 carbon atoms, alkoxy of up to 18 carbon atoms, cycloalkyl of up to 18 carbon atoms, amino, mono- and dialkyl substituted amino wherein each alkyl has up to 18 carbon atoms, R_1 is alkenylene of 2 *n* carbon atoms and *n* conjugated double carbon to carbon bonds when $n = 1$ to 5, alkyl substituted derivatives thereof wherein the alkyl is of 1 or 2 carbon atoms, phenyl substituted derivatives thereof and alkyl and phenyl substituted derivatives thereof.

4,082,722

PRE-MIXED DENTAL COMPOSITION FOR THE PREPARATION OF A DENTAL SILICATE CEMENT

Werner Schmitt, Prinzenweg 10; Robert Purrmann, Riemerschmidstrasse 18, both of Starnberg; Peter Jochum, An der Beermahd, 8031 Hechendorf; Wolf-Dieter Zahler, Graf Toerring-Strasse 19, Hechendorf, and Rainer Grimm-Lenz, Munchener Strasse 9, Seefeld, Upper Bavaria, all of Germany

Continuation-in-part of Ser. No. 404,886, Oct. 10, 1973, Pat. No. 3,986,998, which is a continuation-in-part of Ser. No. 213,829, Dec. 29, 1971, abandoned. This application Sep. 8, 1976, Ser. No. 721,443

Claims priority, application Germany, Jan. 15, 1971, 2101889

Int. Cl.[2] C08K *3/34*

U.S. Cl. 260—42.43 5 Claims

1. A pre-mixed dental composition for the preparation of a dental silicate cement, when mixed with water, which consists essentially of an aluminum fluorosilicate glass powder and a solid polymeric material selected from the group consisting of homopolymer of an ethylenically unsaturated alpha, beta-dicarboxylic acid of 4–5 carbon-atoms, copolymer of said acids with each other, and copolymer of said acids with less than 10 mole percent of an ethylenically unsaturated monocarboxylic acid, methacrylic ester whose ester moiety is alkyl of 1-4 carbon atoms or methacrylic amide, the weight ratio of said powder to said polymer being 1.5:1 to 20:1.

4,082,723

AZA-ADAMANTANE COMPOUND STABILIZERS FOR ORGANIC POLYMER COMPOSITIONS

Norbert Mayer, Gersthofen; Gerhard Pfahler, Augsburg, and Hartmut Wiezer, Gersthofen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

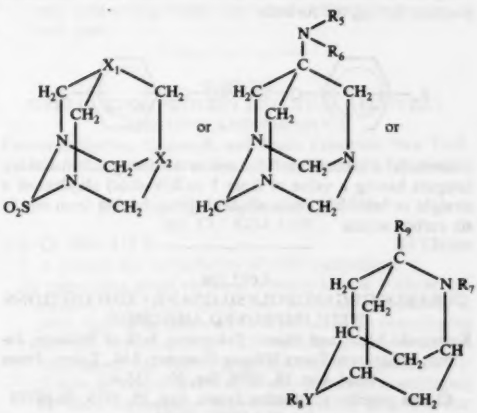
Filed Oct. 4, 1976, Ser. No. 729,483

Claims priority, application Germany, Oct. 9, 1975, 2545292

Int. Cl.[2] C08K *5/34, 5/35*

U.S. Cl. 260—45.8 N 3 Claims

1. Organic polymer-containing plastics molding composition having as stabilizer for the polymer against decomposition by light and heat 0.01–5% by weight of the polymer of one or more aza-adamantane compounds of the formula



wherein

X_1 is nitrogen, phosphorus, phosphoryl, thiophosphoryl, methine, or methine substituted by phenyl or methyl;

X_2 is nitrogen, methine, or methine substituted by aryl;

R_5 is hydrogen, hydroxyl or methyl;

R_6 is hydrogen, alkyl of 1–30 carbons or aryl;

may optionally be nitro;

Y is nitrogen;

R_7 and R_8 each are hydrogen, methyl, benzyl, oxygen or tosyl;

R_9 is hydrogen, halogen, hydroxyl or amino; and

R_8-Y< may optionally be methylene or oxygen.

4,082,724

PRODUCTION OF AROMATIC POLYESTERS OF IMPROVED COLOR

Warren Hewertson, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 877,503, Nov. 17, 1969, Pat. No. 3,830,775. This application May 24, 1974, Ser. No. 473,249

Claims priority, application United Kingdom, Dec. 3, 1968, 57269/68

The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl.[2] C08G *63/02, 63/76*

U.S. Cl. 260—45.75 B **4 Claims**

1. A polyethylene terephthalate composition comprising highly polymeric polyethylene terephthalate and in an amount sufficient to prevent color degradation of said polyethylene terephthalate (1) a trihalide or tri(pseudohalide) of antimony, and (2) an organic oxo compound of phosphorus.

4,082,725

FLAME RETARDANT PLASTIC COMPOSITIONS

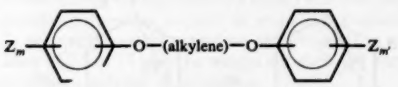
Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation of Ser. No. 330,779, Feb. 8, 1973, abandoned, and a continuation-in-part of Ser. No. 260,240, Jun. 6, 1972, abandoned. This application Nov. 8, 1976, Ser. No. 739,461

Int. Cl.[2] C08K *5/06*

U.S. Cl. 260—45.75 B **17 Claims**

1. A plastic composition comprising an elastomer having incorporated therein an effective amount of a bis-phenoxy compound, which functions as a flame retardant for said composition, having the formula



wherein (a) Z is bromine; (b) *m* and *m'* are independent and are integers having a value of from 1 to 5; and (c) alkylene is a straight or branched chain alkylene group having from one to six carbon atoms.

4,082,726

CURABLE ORGANOPOLYSILOXANE COMPOSITIONS WITH IMPROVED ADHESION

Katsutoshi Mine, and Masuo Yokoyama, both of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Aug. 18, 1976, Ser. No. 715,363

Claims priority, application Japan, Aug. 19, 1975, 50-99768

Int. Cl.[2] C08G *77/04*

U.S. Cl. 260—46.5 UA **10 Claims**

1. A curable organopolysiloxane composition consisting essentially of a mixture of

A. an organopolysiloxane containing at least two lower alkenyl groups bonded to silicon atoms which are in the same molecule,

B. an organopolysiloxane containing at least two hydrogen atoms bonded to silicon atoms which are in the same molecule,

wherein the total number of lower alkenyl groups and hydrogen atoms bonded to silicon in the mixture is at least 5,

C. a catalyst,

the improvement comprising, adding to the components (A), (B) and (C), a fourth component

(D) an organosilicon compound having at least one $Q(R''O)_2Si$- group and at least one lower alkenyl group or hydrogen atom bonded to silicon atoms which are in the same molecule, wherein Q is a monovalent hydrocarbon radical containing at least one epoxy group and R'' is a lower alkyl group.

4,082,727

METHOD FOR MANUFACTURE OF NON-COAGULATIVE ORGANOSILICONE POLYMER

Akira Nagata, Kawanishi, and Jun Iyoda, Ikeda, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 19, 1976, Ser. No. 734,011

Claims priority, application Japan, Oct. 21, 1975, 50-127004

Int. Cl.[2] C08G *77/04*

U.S. Cl. 260—46.5 G **8 Claims**

1. A method for the manufacture of a non-coagulative organosilicone polymer, which comprises reacting an isocyanate group-containing organosilicon compound of the formula, $OCN(CH_2)_3SiR_m(OR')_{3-m}$, wherein R denotes an alkyl or aryl group, R' denotes a group selected from the class consisting of alkyl, aryl, alkoxyalkyl, and acyl groups, and *m* is the integer having the value of 0, 1 or 2, with a heparin compound soluble in organic solvents, to which are dissolved in a non-protonic organic solvent and held therein at a temperature in the range of from 20° to 80° C for a period of from 0.5 to 24 hours thereby affording a reaction product containing therein an organosilicon compound containing a heparin residue wherein there is 1/30 to $\frac{1}{4}$ silicon atom per hexose ring of the heparin backbone; subsequently separating said heparin residue-containing organosilicon compound from said reaction product and purifying the separated compound; and causing the purified heparin residue-containing organosilicon compound to react, in the presence of water, with an organosilicone resin intermediate which is also capable of readily undergoing hydrolysis in the presence of water and consequently forming a siloxane linkage via copolycondensation of silanol intermediates.

4,082,728

XYLENE-FORMALDEHYDE RESIN COMPOSITIONS AND PROCESS

Walid Y. Aziz, Warrensville; Lawrence E. Ball, Cuyahoga Falls, and Irving Rosen, Warrensville Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 23, 1976, Ser. No. 716,545

Int. Cl.[2] C08G *10/02*

U.S. Cl. 260—67 A **11 Claims**

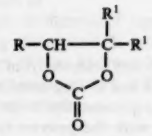
1. The process for preparing solid light colored, containing less than 2% oxygen by weight thermoplastic xylene-formaldehyde polymers having a molecular weight greater than 20,000 comprising reacting formaldehyde or a formaldehyde producing material with m-xylene in the presence of an acid catalyst at an elevated temperature in a closed reactor from which air is excluded during the reaction.

4,082,729
PROCESS FOR THE PREPARATION OF OXYMETHYLENE POLYMERS

Karlheinz Burg, Naurod, Taunus, and Helmut Schlaf, Fischbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 31, 1976, Ser. No. 719,078
Claims priority, application Germany, Sep. 2, 1975, 2538954
Int. Cl.[2] C08G 2/24, 2/10
U.S. Cl. 260—67 FP 4 Claims

1. In a process for the preparation of oxymethylene polymers by the homopolymerization of trioxane or copolymerization of trioxane and acetal compounds copolymerizable therewith in the presence of a cationically active salt-like initiator, the improvement which comprises using the initiator in the form of a solution in a liquid cyclic carbonic acid ester of the formula



wherein R is selected from hydrogen, phenyl, and alkyl of 1 to 3 carbon atoms, and R^1 is selected from hydrogen and unsubstituted alkyl of 1 to 3 carbon atoms.

4,082,730
GLYOXAL MODIFIED POLY (BETA-ALANINE) STRENGTHENING RESINS FOR USE IN PAPER

Terence W. Rave, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 521,002, Nov. 4, 1974, abandoned. This application Jan. 21, 1976, Ser. No. 651,374
Int. Cl.[2] C08L 33/26
U.S. Cl. 260—72 R 2 Claims

1. A cationic water-soluble resin which comprises the reaction product of a cationic branched water-soluble poly(β-alanine) having a molecular weight in the range of from about 500 to about 10,000 with from about 10 to about 100 mole %, based on the amide repeating units of the poly(β-alanine) of glyoxal said cationic branched water-soluble poly(β-alanine) having been produced by the anionic polymerization of acrylamide in a suitable organic reaction medium inert to the reaction conditions in the presence of a basic catalyst and a free-radical inhibitor and then the reaction of the polymerized acrylamide with sufficient dimethylamine and formaldehyde to introduce from about 2 to about 15 mole % of cationic groups, based on amide repeating units.

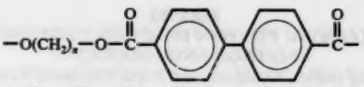
4,082,731
METHOD FOR PRODUCING A HIGH MODULUS POLYESTER YARN

William N. Knopka, Medford, N.J., assignor to Avtex Fibers Inc., Valley Forge, Pa.

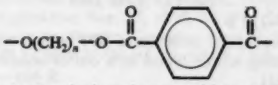
Continuation-in-part of Ser. No. 331,652, Feb. 12, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 644,388
Int. Cl.[2] C08G 63/12
U.S. Cl. 260—75 T 12 Claims

1. Method for producing a high modulus yarn from a copolyester resin which yarn is heat-settable without tension comprising:

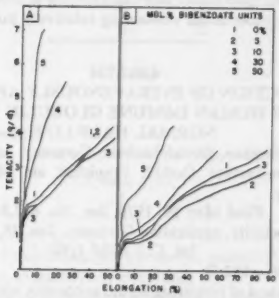
a. forming filaments from a copolyester resin consisting of at least 15 to 50 mole percent of an interpolymerized randomly repeating unit having the formula:



and from 85 to 50 percent of an interpolymerized randomly repeating unit having the formula:



wherein n for both units is an integer of from 2 to 10, the fiber resin having an intrinsic viscosity of at least about 0.55 as



determined in a 60 weight percent phenol and 40 weight percent tetrachloroethane solution at 30° C;

b. combining the resulting filaments into a yarn;

c. uniformly orienting the resulting yarn by drawing the yarn at a temperature of about 20° C higher than its glass transition temperature and at 75% of its break-draw ratio, and

d. heat-setting the oriented yarn by passing it through a heat zone maintained about 125° to 185° C for a time ranging from 1 to 10 minutes, while in a free-to-relax condition, said heat-setting being conducted without tensioning of said yarn.

4,082,732
DEBLOCKING PROTEIN FRACTION RECOVERY METHOD AND PRODUCT

Lawrence Burton, Commack, and Frank Friedman, New York, both of N.Y., assignors to Immunology Research Foundation, Inc., Great Neck, N.Y.

Filed Jul. 29, 1975, Ser. No. 600,026
Int. Cl.[2] A23J 1/06
U.S. Cl. 260—112 B 10 Claims

1. A process for the isolation of DPF comprising:

(a) suspending blood serum in a nearly neutral buffered pH solution (b) centrifuging the resultant suspension at 5400–10,000g to isolate a first supernatant (c) centrifuging the first supernatant at 5400–10,000g to give a second supernatant (d) centrifuging the second supernatant at 23,000–48,000g to give a third supernatant (e) centrifuging the third supernatant at 269–369 $\times$ 10^3g to give a first sediment and a fourth supernatant (f) extracting the fourth supernatant with ethyl ether and retaining the aqueous phase (g) heating the aqueous phase to 55° C.–60° C. and centrifuging at 35–42 $\times$ 10^3g, giving a second sediment and a fifth supernatant which is a clear, substantially colorless liquid (h) centrifuging the fifth supernatant liquid at 1.05–2.69 $\times$ 10^5g yielding DPF as the sediment.

4,082,733

BLOCKING PROTEIN FRACTION RECOVERY METHOD AND PRODUCT

Lawrence Burton, Commack, and Frank Friedman, New York, both of N.Y., assignors to Immunology Research Foundation, Inc., Great Neck, N.Y.

Filed Jul. 29, 1975, Ser. No. 600,028
Int. Cl.[2] A23J *1/06*
U.S. Cl. 260—112 B 7 Claims

1. A process for the isolation of BPF which comprises:
(a) suspending whole blood in a buffer solution of nearly neutral pH
(b) centrifuging the whole blood suspension at 5400–10,000g to obtain a first supernatant
(c) centrifuging the first supernatant at 20,000 to 25,000g to give a BPF sediment
(d) optionally purifying the BPF sediment by resuspending it in an alkaline buffer and centrifuging at 20,000–25,000g to give a supernatant containing relatively pure BPF.

4,082,734

PRODUCTION OF INTRAVENOUSLY APPLICABLE NATIVE HUMAN IMMUNE GLOBULIN HAVING A NORMAL HALF-LIFE

Wolfgang Stephan, Dreieichenhain, Germany, assignor to Biotest-Serum-Institut GmbH, Frankfurt am Main-Niederrad, Germany

Filed May 19, 1976, Ser. No. 687,842
Claims priority, application Germany, Jun. 18, 1975, 2527064
Int. Cl.[2] A23J *1/06*
U.S. Cl. 260—112 B 5 Claims

1. A method of preparing an intravenously applicable native-human immune globulin of substantially unchanged half-life and antibody activity but free from anti-complement activity, comprising heating human plasma or human serum for about 2 to 4 hours at about 50° to 56° C, and then fractionating, the heating having been long enough within the recited parameters so that the product upon fractionation is substantially free from anti-complement activity.

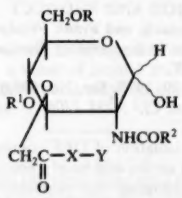
4,082,735

NOVEL IMMUNOLOGICAL ADJUVANT COMPOUNDS AND METHODS OF PREPARATION THEREOF

Gordon H. Jones, Cupertino; John G. Moffatt, Los Altos, and John J. Nestor, Jr., Sunnyvale, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 26, 1976, Ser. No. 680,260
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 50 Claims

1. A compound selected from those of the formula:



(I)

wherein
each of R and R^1 are the same or different and are selected from the group consisting of hydrogen or an acyl radical containing from 1 to 22 carbon atoms;
R^2 is selected from the group consisting of an unsubstituted or substituted alkyl radical containing from 1 to 22 carbon atoms, or an unsubstituted or substituted aryl radical containing from 6 to 10 carbon atoms;
X is an aminoacyl moiety selected from the group consisting of
L-alanyl,
L-valyl,
L-leucyl,
L-isoleucyl,
L-α-aminobutyryl,
L-seryl,
L-threonyl,
L-methionyl,
L-cysteinyl,
L-phenylalanyl,
L-tyrosyl,
L-tryptophanyl,
L-lysyl,
L-ornithyl,
L-arginyl,
L-histidyl,
L-glutamyl,
L-glutaminyl,
L-aspartyl,
L-asparaginyl,
L-prolyl, or
L-hydroxyprolyl;
Y is an amino acid moiety selected from the group consisting of D-isoasparagine and D-isoglutamine; and
the wavy lines (ξ) represent the α- or β-configuration or mixtures thereof, with the proviso that when one wavy line is α, the other is β.

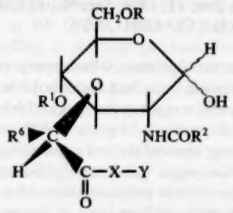
4,082,736

NOVEL IMMUNOLOGICAL ADJUVANT COMPOUNDS AND METHODS OF PREPARATION THEREOF

Gordon H. Jones, Cupertino; John G. Moffatt, Los Altos, and John J. Nestor, Jr., Sunnyvale, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 26, 1976, Ser. No. 680,618
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 51 Claims

1. A compound selected from those of the formula:



(I)

wherein each of R and R^1 are the same or different and are selected from the group consisting of hydrogen or an acyl radical containing from 1 to 22 carbon atoms;
R^2 is selected from the group consisting of an unsubstituted or substituted alkyl radical containing from 1 to 22 carbon atoms, or an unsubstituted or substituted aryl radical containing from 6 to 10 carbon atoms;
R^6 is selected from the group consisting of an alkyl radical containing from 1 to 4 carbon atoms;
X is an aminoacyl moiety selected from the group consisting of

L-valyl,	L-phenylalanyl,
L-leucyl,	L-tyrosyl,
L-isoleucyl,	L-tryptophanyl,
L-α-aminobutyryl,	L-lysyl,
L-threonyl,	L-ornithyl,
L-methionyl,	L-arginyl,
L-cysteinyl,	L-histidyl,
L-glutamyl,	L-asparaginyl,
L-glutaminyl,	L-prolyl, or
L-aspartyl,	L-hydroxyprolyl;

Y is an amino acid moiety selected from the group consisting of

D-isoasparagine and D-isoglutamine; and the wavy lines (ξ) represent the α- or β-configuration or mixtures thereof, with the proviso that when one wavy line is α, the other is β.

4,082,737

STABILIZED THYMOSIN COMPOSITION AND METHOD

Weldon Courtney McGregor, Montville; Harold Leon Newmark, Maplewood, and Armin Hermann Ramel, Mountain Lakes, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 22, 1977, Ser. No. 770,480
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 7 Claims

1. A solid stable endotoxin and pyrogen free form of thymosin fraction 5 comprising in combination:

A. A major amount of thymosin fraction 5; and minor, effective amounts each of

B. a phenolic type antimicrobial agent, selected from the group consisting phenol cresols and the pharmaceutically acceptable esters of para hydroxy benzoic acids and

C. a buffering agent in an amount sufficient to provide a pH of 7–8 on reconstitution.

4,082,738

CYANOCOBALAMIN DERIVATIVES

Gordon Dean Niswender, and James M. Hudson, both of Fort Collins, Colo., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 552,919, Feb. 25, 1975, Pat. No. 3,981,863.
This application May 24, 1976, Ser. No. 689,280
Int. Cl.[2] A23J *1/08, 1/06*
U.S. Cl. 260—121 2 Claims

1. A vitamin B_{12} protein conjugate in which a protein selected from bovine serum albumin, sheep serum albumin, rabbit serum albumin, goat serum albumin, polysine, thyroglobulin or gamma-globulin is covalently bonded through one of the $CH_2CH_2CONH_2$ or $—CH_2CONH_2$ groups initially present in one of the pyrrole nucleus of the vitamin B_{12} molecule.

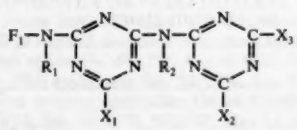
4,082,739

FIBRE-REACTIVE DYESTUFF CONTAINING A BIS-TRIAZINYLAMINO

Karl Seitz, Oberwil, Basel-land, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 208,412, Dec. 15, 1971, abandoned.
This application Dec. 26, 1973, Ser. No. 427,896
Int. Cl.[2] C09B *62/06, 62/08;* D06P *1/382, 3/66*
U.S. Cl. 260—146 T 6 Claims

1. A dyestuff of the formula



wherein F_1 is an azo dyestuff radical, R_1 is hydrogen, lower alkyl, or phenyl, R_2 is hydrogen, lower alkyl, chloro-lower alkyl, bromo-lower alkyl, cyano-lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, benzyl or phenyl, X_1 and X_2 each is chloro, bromo or fluoro, and X_3 is chloro, bromo, fluoro, lower alkyl, phenyl, lower alkylthio, phenylthio, lower alkoxy, phenoxy, amino, lower alkyl-amino, di-(lower alkyl-)amino, phenylamino, phenyl(lower alkyl)-amino, benzylamino, hydroxylamino, hydrazino, phenyl hydrazino, morpholino, piperidino, piperazino or $—N(R_3)—F_2$, wherein R_3 is hydrogen, lower alkyl, or phenyl, and F_2 is an azo dyestuff radical.

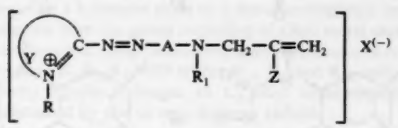
4,082,740

QUATERNARY BASIC AZODYESTUFFS CONTAINING A PROPENYL AMINO RADICAL

Reinhard Mohr, Offenbach am Main; Eberhard Mundlos, Heusenstamm, and Kurt Hohmann, Neu-Isenburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

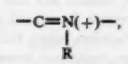
Continuation of Ser. No. 642,671, Dec. 19, 1975, abandoned.
This application Nov. 15, 1976, Ser. No. 741,661
Claims priority, application Germany, May 17, 1975, 2522174
Int. Cl.[2] C09B *29/00, 45/12;* D06P *1/08, 1/10*
U.S. Cl. 260—146 R 10 Claims

1. A basic azo dyestuff which is free from sulfonic acid groups and has the formula



wherein

Y, together with



is thiazolyl, benzothiazolyl, pyrazolyl, indazolyl, triazolyl, guanazolyl, quinolinyl or pyridinyl,

A is phenylene or phenylene substituted by chlorine, methyl, ethyl, methoxy, ethoxy, carboxylic acid alkyl ester having from 2 to 5 carbon atoms, or acetylamino;

R and R_1 are identical or different and each represent hydrogen, alkyl having from 1 to 4 carbon atoms, beta-cyanoethyl, beta-hydroxyethyl, beta-chloroethyl, beta-chloro-γ-hydroxypropyl, beta-acetoxyethyl or benzyl,

Z is hydrogen or methyl, and

$X^{(-)}$ is an anion.

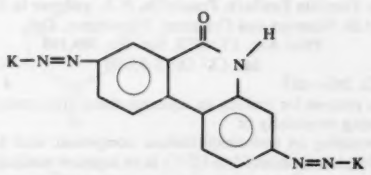
4,082,741

DISAZO PIGMENTS DERIVED FROM 3,8-DIAMINO-PHENANTHRIDONE-(10)

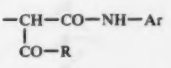
Klaus Hunger, and Dieter Weber, both of Kelkheim, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 16, 1976, Ser. No. 751,072
Claims priority, application Germany, Dec. 20, 1975, 2557555
Int. Cl.[2] C09B *33/12, 33/14;* D06P *1/44, 1/52*
U.S. Cl. 260—154 10 Claims

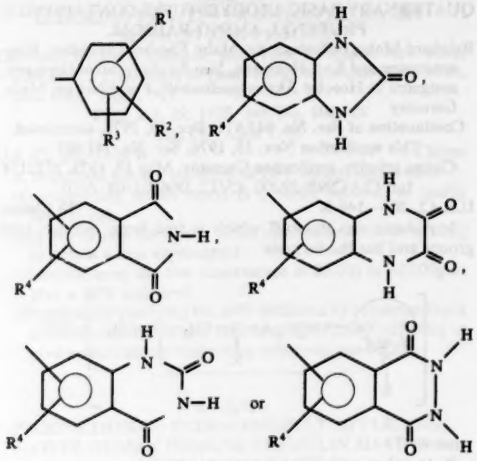
1. A compound of the formula



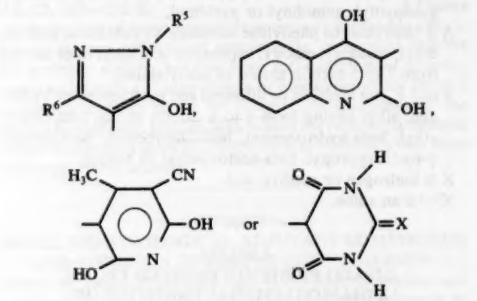
wherein K stands for the same or different groups of the formula



in which R is methyl or phenyl and Ar is a group of the formula



wherein R^1, R^2 and R^3, which are the same or different, are hydrogen, chlorine, bromine, lower alkyl, lower alkoxy, lower alkanoylamino, benzoylamino, nitro, trifluoromethyl or cyano; R^4 is hydrogen, chlorine, bromine, lower alkyl, lower alkoxy, lower carboalkoxy or nitro, or K is a group of the formula



wherein R^5 is phenyl, tolyl or chlorophenyl; R^6 is methyl, lower carboalkoxy or lower alkanoylamino and X is oxygen, sulfur or =NH.

4,082,742

PROCESS FOR PREPARING AN AQUEOUS DISAZO DYE CONCENTRATE

George Franklin Eastlack, Pennsville, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 17, 1973, Ser. No. 389,196

Int. Cl.² C09B *31/08*

U.S. Cl. 260—187 **4 Claims**

1. A process for making an aqueous disazo dye concentrate, consisting essentially of

(i) reacting an aminonaphthalene compound with benzoyl chloride at about 0° to 50° C. in an aqueous medium in the presence of an amount of tertiary amine sufficient to maintain pH at between about 4 and 7, the tertiary amine having the formula

wherein R_1 is a hydroxyalkyl radical of 2 to 4 carbons and R_2 and R_3 are independently alkyl radicals of 1 to 4 carbons or hydroxyalkyl of 2 to 4 carbons, thereby forming the benzamide derivative of the aminonaphthalene compound,

(ii) diazotising p-(p-aminophenylazo)benzene sodium sulfonate in aqueous media at about 0° to 35° C., and isolating the product diazonium salt; and

(iii) coupling the product of (i) to the product of (ii) at a temperature between about 15° C. to 30° C. in the presence of a viscosity-reducing agent and sufficient of the tertiary amine to maintain the pH of the reaction mass at between about 5 and 7.

4,082,743

PROCESS FOR THE PRODUCTION OF DIALDEHYDE CELLULOSE FROM CELLULOSE

William Montgomery Hearon, Portland, Oreg.; John F. Witte, and Cheng Fan Lo, both of Vancouver, Wash., assignors to Boise Cascade Corporation, Portland, Oreg.

Filed Jan. 28, 1975, Ser. No. 544,849

Int. Cl.² C08B *15/00*

U.S. Cl. 536—30 **10 Claims**

1. The process for the production of dialdehyde cellulose which comprises: reacting cellulose in aqueous medium with meta periodate ion using from 1.2 to 12 moles meta periodate ion per mole cellulose at a temperature of from 36° to 60° C. and a pH of between 2 and the pH at which periodic acid is converted in aqueous medium to a substantially water insoluble paraperiodate, for a time sufficient to convert the cellulose substantially completely to dialdehyde cellulose, and separating the dialdehyde cellulose product from the reaction mixture.

4,082,744

4-BENZAZONINE DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

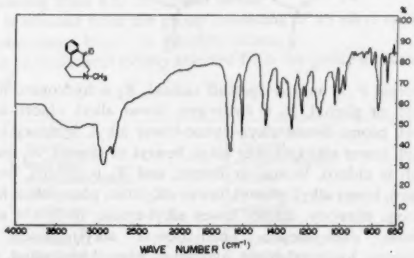
Masao Ikeda; Shigeo Miyamoto; Thutomu Nozawa; Akira Kurobe, all of Toyama, and Osamu Futsukaichi, Shinminato, all of Japan, assignors to Nihon Iyakuhin Kogyo Co., Ltd., Japan

Division of Ser. No. 467,520, May 6, 1974, Pat. No. 4,008,219. This application Jul. 21, 1976, Ser. No. 707,276

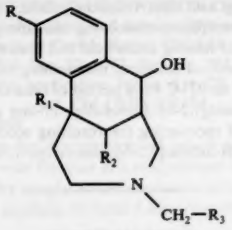
Claims priority, application Japan, May 8, 1973, 48-51458; May 8, 1973, 48-51459; May 8, 1973, 48-51460; May 8, 1973, 48-51461; Jan. 16, 1974, 49-7683; Feb. 5, 1974, 49-15281, Feb. 5, 1974, 49-15282

Int. Cl.² C07D *225/08*

U.S. Cl. 260—239 BB **16 Claims**



1. A compound selected from the group consisting of a 4-benzazonine of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein

R is hydrogen, hydroxy or alkoxy of up to 3 carbon atoms;

R_1 is hydrogen or alkyl of up to 3 carbon atoms;

R_2 is hydrogen, methyl or ethyl; and

R_3 is hydrogen, straight or branched alkyl of up to 4 carbon atoms, straight or branched alkenyl of up to 4 carbon atoms, mono- or dihydroxyalkyl of up to 2 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, or phenylmethyl.

4,082,745

PROCESS FOR THE PREPARATION OF PHOSPHORUS DERIVATIVES OF SECONDARY AMMONIUM SALTS OF PENAM AND CEPHEM COMPOUNDS

Poul Borrevang, Rodovre; Erling Guddal, Skovlunde; Henning Borge Petersen, Lyngby; Peter Faarup, Frederiksberg, and Jorgen Ilum Nielsen, Farum, all of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed Mar. 22, 1976, Ser. No. 669,048

Claims priority, application United Kingdom, Mar. 26, 1975, 12788/75; Jun. 24, 1975, 26826/75

Int. Cl.[2] C07D *499/14, 501/04*

U.S. Cl. 260—239.1 **6 Claims**

1. In the conversion of 6-amino-penicillanic acid to secondary ammonium salt phosphite amides thereof, the improvement which comprises the steps of reacting 6-aminopenicillanic acid with a member selected from the group consisting of:

2-diethylamino-1,3,2-dioxaphospholane

2-diisopropylamino-1,3,2-dioxaphospholane

2-diethylamino-4-methyl-1,3,2-dioxaphospholane

2-diethylamino-1,3,2-dioxaphosphorinane,

the phosphite group reacting with the 6-amino group and the dialkyl amino group reacting with acid group to form the desired secondary ammonium salt.

4,082,746

1,3-DIPHENYL-4 OR 5-SULPHOALKYL PYRAZOLINES

Ivan Joseph Bolton, Bingley, and Alec Victor Mercer, Leeds, both of England, assignors to Sandoz Ltd., Basel, Switzerland

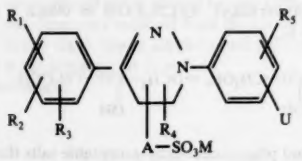
Division of Ser. No. 601,279, Aug. 4, 1975, Pat. No. 3,997,556. This application Sep. 23, 1976, Ser. No. 725,853

Claims priority, application United Kingdom, Aug. 9, 1974, 35129/74; Feb. 10, 1975, 5523/75; May 12, 1975, 1978/75

Int. Cl.[2] C07D *231/06*

U.S. Cl. 260—239.9 **11 Claims**

1. A compound, of formula I,



I

in which

R_1, R_2 and R_3, independently, signify hydrogen, chlorine, fluorine, C_{1-4}alkyl or C_{1-4}alkoxy,

R_4 signifies hydrogen, C_{1-4}alkyl or phenyl,

A signifies a straight C_{1-3}alkylene chain, unsubstituted or substituted by methyl,

R_5 signifies hydrogen, chlorine, C_{1-4}alkyl or C_{1-4}alkoxy, and

U signifies hydrogen, cyano, chlorine, $-SO_2R_6$, $-CO_2R_7$, $-SO_2NR_8R_9$ or $-CONR_8R_9$, in which R_6 signifies hydrogen or C_{1-4}alkyl, unsubstituted or mono-substituted by —COOM, C_{1-4}alkoxycarbonyl, aminocarbonyl or cyano,

R_7 signifies hydrogen or C_{1-4}alkyl, unsubstituted or mono-substituted by C_{1-4}alkoxy, and

R_8 and R_9, independently, signify hydrogen, phenyl, unsubstituted alkyl or alkyl mono-substituted by hydroxy, and

M signifies a hydrogen atom or a non-chromophoric cation selected from the group consisting of alkali metal cations, alkaline-earth metal cations and ammonium cations of the formula $R_{10}R_{11}R_{12}NH^{\oplus}$ where R_{10}, R_{11} and R_{12}, independently signify hydrogen or C_{1-4}alkyl unsubstituted or substituted by one or two hydroxy radicals.

4,082,747

CHEMICAL PROCESS

Jong C. Chen, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Oct. 1, 1975, Ser. No. 618,706

Int. Cl. C07j *19/00*

U.S. Cl. 260—239.57 **3 Claims**

1. In a process for coupling tyrosine or tyrosine methyl ester to 3-carbodigoxigenin glycine, 3-hemiadipyl digoxigenin or digoxigenin-12-acetate-3-hemisuccinate in an inert solvent utilizing an agnet to affect coupling, the improvement comprising utilizing as the agent dicyclohexylcarbodiimide.

4,082,748

PROCESS FOR PRODUCTION OF OXAZINE DIONES

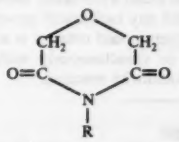
George D. Shier, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 27, 1976, Ser. No. 718,292

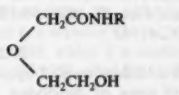
Int. Cl.[2] C07D *265/00, 273/00, 295/00*

U.S. Cl. 544—98 **4 Claims**

1. A process for making a compound having the formula



wherein R is a hydrocarbon group of 1–8 carbon atoms, which process comprises dehydrogenating by contacting a compound of the formula



with a reduced copper dehydrogenation catalyst in the presence of hydrogen at a temperature of about 200°–300° C.

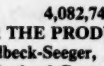
4,082,749

PROCESS FOR THE PRODUCTION OF AMINES

Hans-Juergen Quadbeck-Seeger, Ludwigshafen, and Peter Tonne, Neustadt, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Germany

Filed Jun. 3, 1974, Ser. No. 475,577
Int. Cl.[2] C07C *85/153*
U.S. Cl. 260—250 BN **8 Claims**

1. A process for the production of an amine from a carboxamide by reaction with a hypohalite in an aqueous medium, wherein the carboxamide is reacted with an alkali metal hypochlorite in the presence of a catalyst selected from the group consisting of bromine, iodine, and a compound of the formula (I):



(I)

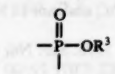
in which

R^1 is a sulfo group, a sulfonate radical or a sulfonamide group;

R^2 is hydrogen, an aliphatic radical, chlorine or bromine;

X is chlorine, bromine or hydrogen;

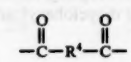
R^1 and R^2 together with the adjacent nitrogen atom may also be members of a heterocyclic radical which contains adjacent to the nitrogen atom at least one sulfonyl group or a phosphonyl group of the formula:



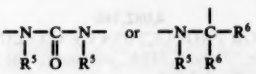
in which

R^3 is hydrogen or alkali metal;

or R^1 and R^2 together may also be the radical



in which R^4 is alkylene, the radical



in which R^5 is hydrogen, chlorine or bromine and R^6 is an aliphatic radical, in an amount of from 0.0001 to 0.1 mole of catalyst per mole of starting carboxamide and in the presence of 1 to 2.1 moles, not including the alkali contained in the hypochlorite molecule, of an alkali metal hydroxide, based on 1 mole of starting carboxamide and any carbamoyl groups in the carboxamide molecule, and wherein said catalyst is added to the reaction mixture prior to or simultaneously with the initiation of the carboxamide-hypochlorite reaction.

4,082,750

TRINITRO-11H-INDENO[1,2-b]QUINOXALINE-11-ONE AND PROCESS FOR PREPARING SAME

Masafumi Ohta, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1976, Ser. No. 734,183
Claims priority, application Japan, Oct. 27, 1975, 50-128366
Int. Cl.[2] C07D *241/42*
U.S. Cl. 260—250 Q **3 Claims**

1. A method for preparing trinitro-11H-indeno[1,2-b]quinoxaline-11-one which comprises the steps of dissolving 11H-indeno[1,2-b]quinoxaline-11-one in a first mixture of fuming nitric acid and concentrated sulfuric acid to form a first solution, maintaining the first solution at about 70° to 80° C for a period of time effective to form a first nitrated reaction product, precipitating said first reaction product, recovering the resulting first precipitate, dissolving the first precipitate in a second mixture of fuming nitric acid and concentrated sulfuric acid to form a second solution, maintaining said second solution at about 90° to 92° C for a period of time effective to form trinitro-11H-indeno[1,2-b]-quinoxaline-11-one as a final reaction product and recovering the resulting second precipitate.

3. Trinitro-11H-indeno[1,2-b]quinoxaline-11-one.

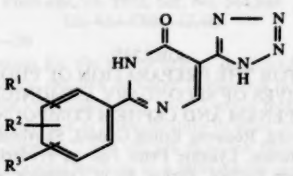
4,082,751

THERAPEUTIC AGENTS

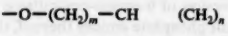
Peter Frederick Juby, Jamesville, and Richard Anthony Partyka, Liverpool, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 657,787, Feb. 13, 1976, abandoned. This application Dec. 8, 1976, Ser. No. 748,851
Int. Cl.[2] C07D *403/04, 403/14;* A61K *31/505*
U.S. Cl. 260—256.4 C **39 Claims**

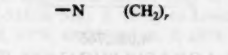
1. A compound of the formula



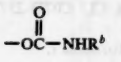
wherein R^1, R^2 and R^3 which may be the same or different are each hydrogen, halogen, (lower)alkyl, (lower)alkenyl, (lower-)alkoxy, —0—(lower)alkenyl,



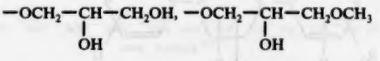
in which m is 0 or an integer from 1 to 6 and *n* is an integer from 2 to 7, $—OCH_2(CH_2)_xO(CH_2)_yCH_3$ in which *x* is 0 or an integer from 1 to 6 and y is 0 or an integer from 1 to 6, CF_3, $—OCF_3$, $—OCH_2CF_3$, hydroxy, (lower)alkylthio, amino, nitro,



in which *r* is 4 or 5, (lower)-alkylamino, di(lower)alkylamino, carboxyl, -$C0_2$-(lower)alkyl, $—O(CH_2)_uCO_2R^a$ in which u is an integer from 1 to 6 and R^a is hydrogen or (lower)alkyl, R^c-CO— in which R^c is (lower)alkyl, R^c-CONH- in which R^c is (lower)alkyl, R^c-COO- in which R^c is (lower)alkyl,



in which R^b is (lower)alkyl, $-O(CH_2)_kOH$ in which k is an integer from 2 to 6,



or $-OCH_2C_6H_5$, and pharmaceutically acceptable salts thereof, with the proviso that R^1, R^2 and R^3 may not all be alike except in the case where they represent (lower)alkoxy.

4,082,752
PROCESS FOR FLUORINATION OF URACIL

Takao Takahara, Mishima, and Susumu Misaki, Minoo, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 29, 1977, Ser. No. 792,223
Claims priority, application Japan, Apr. 29, 1976, 51-49163
Int. Cl.[2] C07D *239/54*
U.S. Cl. 260—260 10 Claims

1. A process for fluorination of uracil which comprises treating uracil with fluorine at a temperature of −10° to 15° C in a 50 to 85% by weight aqueous solution of hydrofluoric acid as the reaction medium to form 5-fluorouracil.

4,082,753
PENNICLAVINE ACETONIDE

Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 658,439, Feb. 17, 1976, which is a continuation-in-part of Ser. No. 603,408, Aug. 11, 1975, Pat. No. 3,968,112, which is a division of Ser. No. 494,147, Aug. 2, 1974, Pat. No. 3,929,796. This application Jun. 17, 1977, Ser. No. 807,459
Int. Cl.[2] C07D *457/10*
U.S. Cl. 260—285.5 1 Claim

1. Penniclavine acetonide.

4,082,754
DES-N-METHYLVINDOLINE

Donald R. Brannon, Pittsboro, and Norbert Neuss, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 398,724, Sep. 19, 1973, Pat. No. 3,989,593. This application Dec. 4, 1975, Ser. No. 637,908
Int. Cl.[2] C07D *401/02*
U.S. Cl. 260—287 P 1 Claim

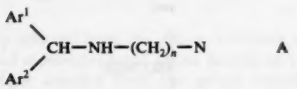
1. Des-N-methylvindoline.

4,082,755
1-[(DIARYLMETHYL)AMINOALKYL]PIPERIDIMES

Ineke van Wijngaarden; Willem Soudijn, both of Oud-Turnhout; Jan Vandenberk, Beerse, and Jozef Fr. Hens, Nijlen, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Feb. 14, 1977, Ser. No. 768,527
Int. Cl.[2] C07D *401/04*
U.S. Cl. 260—293.6 5 Claims

1. A chemical compound selected from the group consisting of a piperidine derivative having the formula



A

and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl being phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and trifluoromethyl;

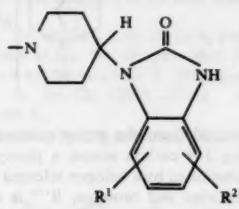
n is the integer 2 or 3; and

the radical

A

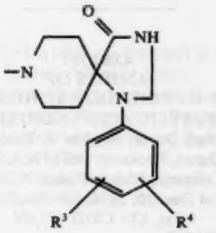
is a member selected from the group consisting of the following:

a. a radical of the formula



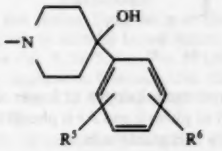
wherein R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and lower alkyloxy;

b. a radical of the formula



wherein R^3 and R^4 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, lower alkyloxy and trifluoromethyl; and

c. a radical of the formula



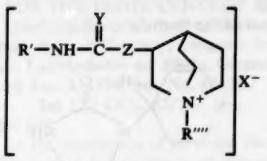
wherein R^5 is selected from the group consisting of hydrogen and methyl; and R^6 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl.

4,082,756
QUATERNARY QUINUCLIDINIUM CARBAMATES AND THIOCARBAMATES

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 134,827, Apr. 16, 1971, Pat. No. 3,956,479, which is a division of Ser. No. 712,968, Mar. 14, 1968, Pat. No. 3,621,048, which is a continuation-in-part of Ser. No. 578,981, Sep. 16, 1966, abandoned. This application Feb. 20, 1976, Ser. No. 659,625
Int. Cl.[2] C07D *211/42, 211/54*
U.S. Cl. 260—293.53 6 Claims

1. A chemical compound represented by the formula:



where R′ is selected from the group consisting of an alkyl group containing 1–4 carbon atoms, a phenyl group and a phenyl group substituted by a halogen selected from the group consisting of chlorine and bromine; R″″ is an alkyl group containing 10–16 carbon atoms; Y is selected from the group consisting of oxygen and sulfur; Z is selected from the group consisting of oxygen and sulfur; and X is a compatible anion selected from the group consisting of chloride, bromide, iodide and methosulfate.

4,082,757

AMIDES OF 4-HYDROXY-6H-THIENO[2,3-b]THIOPYRAN-5-CARBOXYLIC ACID-7,7-DIOXIDE

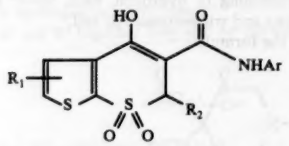
Jagadish C. Sircar, Dover; Stephen J. Kesten, Morris Plains, and Harold Zinnes, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 10, 1976, Ser. No. 749,491

Int. Cl.[2] C07D *495/04*

U.S. Cl. 260—294.8 C **3 Claims**

1. A compound of the Formula I:



I

wherein R_1 is hydrogen, halogen or lower alkyl; R_2 is hydrogen, lower alkyl or phenyl; and Ar is phenyl or pyridyl; and its pharmaceutically acceptable salts.

4,082,758

SUBSTITUTED-(AMINOSULFONYLAMINO) PYRIDINE THIOCARBOXYLIC ACIDS AND DERIVATIVES THEREOF

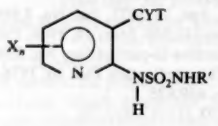
Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 676,591, Apr. 13, 1976, Pat. No. 4,014,888, which is a continuation-in-part of Ser. No. 572,024, Apr. 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Dec. 3, 1976, Ser. No. 747,266

Int. Cl.[2] C07D *213/83*

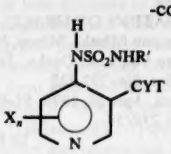
U.S. Cl. 260—294.8 F **7 Claims**

1. A compound of the formulae:



III

and



IV

wherein:

each X independently represents loweralkyl, of 1 to 6 carbon atoms, halologeralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, SR^5, OR^5, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;

n represents an integer of 0 to 3, inclusive;

Y represents sulfur;

T represents a member selected from the group consisting of hydroxy or alkoxy of 1 to 3 carbon atoms;

R′ represents hydrogen, loweralkyl of 1 to 6 carbon atoms, halologeralkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, haloalkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, haloalkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, loweralkoxyalkyl wherein each of alkoxy and alkyl are of from 1 to 6 carbon atoms, dialkylaminoalkyl wherein each alkyl is of from 1 to 6 carbon atoms or $—C(CH_3)_2C{\equiv}N$;

each of R^3 and R^4 independently represent hydrogen or loweralkyl of 1 to 6 carbon atoms;

R^5 represents loweralkyl of 1 to 6 carbon atoms.

4,082,759

SUBSTITUTED-(AMINOSULFONYLAMINO)PYRIDINE THIOCARBOXYLIC ACIDS AND DERIVATIVES THEREOF

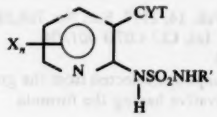
Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 676,591, Apr. 13, 1976, Pat. No. 4,014,888, which is a continuation-in-part of Ser. No. 572,024, Apr. 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Dec. 6, 1976, Ser. No. 747,672

Int. Cl.[2] C07D *213/55*

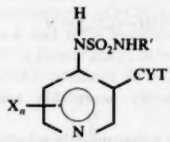
U.S. Cl. 260—294.8 E **2 Claims**

1. A compound of the formulae:



III

and



IV

wherein:

each X independently represents loweralkyl, of 1 to 6 carbon atoms, halologeralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, SR^5, OR^5, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;

n represents an integer of 0 to 3, inclusive;

Y represents sulfur;

T represents a member selected from the group consisting of hydroxy or alkoxy of 1 to 3 carbon atoms;

R′ represents aryl wherein aryl is phenyl, halophenyl, tolyl or benzyl;

each of R^3 and R^4 independently represent hydrogen or loweralkyl of 1 to 6 carbon atoms;
R^5 represents loweralkyl of 1 to 6 carbon atoms.

4,082,760
DERIVATIVES OF 2H,3H-BENZIMIDAZO(1,2-b)OXAZOLE

Fulvio Benigni, Milan, and Lucio Trevisan, Ferrara, both of Italy, assignors to Italchemi S.p.A. Istituto Chimico Farmaceutico, Milan, Italy

Filed Dec. 5, 1975, Ser. No. 638,038
Int. Cl.² C07D *498/14*
U.S. Cl. 260—307 FA **3 Claims**

1. 2H,3H-benzimidazo-(1,2-b)oxazole.
2. 2-hydroxymethyl-2H,3H-benzimidazo-(1,2-b)oxazole.
3. 2-carbethoxy-3-methyl-2H,3H-benzimidazo-(1,2-b)oxazole.

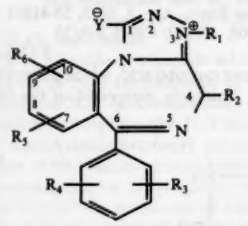
4,082,761
TRIAZOLO[4,3-a][1,4]BENZODIAZEPINIUM QUATERNARY SALTS

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 4, 1973, Ser. No. 393,940
The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.
Int. Cl.² C07D *487/04*
U.S. Cl. 260—308 R **17 Claims**

1. An inner salt compound of the formula

IV, V, IX, X, XI



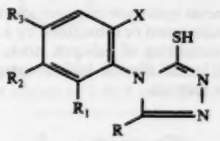
wherein Y is selected from the group consisting of hydroxy, mercapto and monosubstituted amino having an electronegative substituent selected from the group consisting of (1) arylamino wherein the aryl moiety is selected from the group consisting of phenyl and naphthyl, (2) alkanoylamino of 2 through 4 carbon atoms, (3) aroylamino wherein the aroyl moiety is selected from the group consisting of benzoyl and naphthoyl, (4) alkanesulfonamido of 1 through 3 carbon atoms and (5) arylsulfonamido wherein the aryl moiety is selected from the group consisting of phenyl and naphthyl; R_1 is lower alkyl of 1 through 3 carbon atoms; R_2 is selected from the group consisting of hydrogen and lower alkyl of 1 through 3 carbon atoms; R_3, R_4, R_5 and R_6 are selected from the group consisting of hydrogen, lower alkyl of 1 through 3 carbon atoms, halogen, nitro, trifluoromethyl, cyano, lower alkoxy of 1 through 3 carbon atoms and lower alkylthio of 1 through 3 carbon atoms, $\ominus$ appearing above Y indicates that the compound is an inner salt; $\oplus$ is the cation of the compound.

4,082,762
4-(2-HALOPHENYL)-1,2,4-TRIAZOLE-3-THIOL COMPOUNDS

Charles J. Paget, Indianapolis, and James H. Wikel, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 607,848, Aug. 25, 1975, Pat. No. 4,008,242, which is a division of Ser. No. 449,141, Mar. 7, 1974, Pat. No. 3,937,713. This application Nov. 5, 1976, Ser. No. 739,158
Int. Cl.² C07D *249/12*
U.S. Cl. 260—308 R **7 Claims**

1. A 4-(o-halophenyl)-1,2,4-triazole-3-thiol compound of the formula



wherein
R is hydrogen, C_1–C_{11} alkyl, cyclopropyl or trifluoromethyl;
R_1 is hydrogen, bromo, chloro or fluoro;
R_2 and R_3 are independently hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, bromo, chloro, fluoro or trifluoromethyl with the limitation that at least one of R_2 and R_3 is hydrogen;
X is bromo, chloro or fluoro;
subject to the further limitation that when R_1 is halogen, R is other than hydrogen and R_2 is hydrogen.

4,082,763
PROCESS FOR PRODUCING 3-HYDRAZINO-4-AMINO-5-MERCAPTO-1,2,4-TRIAZOLE

Gerhard Meyer, and Anton Toth, both of Obernburg, Main, Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jul. 7, 1975, Ser. No. 593,572
Claims priority, application Germany, Jul. 13, 1974, 2433746
Int. Cl.² C07D *249/12*
U.S. Cl. 260—308 R **9 Claims**

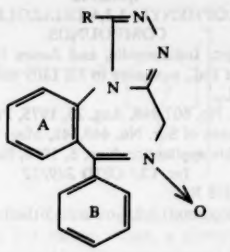
1. A process for the selective production of 3-hydrazino-4-amino-5-mercapto-1,2,4-triazole which comprises heating hydrazinium-dithiocarbazinate with 4 to 6 mols of hydrazine hydrate for each mol of hydrazinium-dithiocarbazinate at about 50° C. to 85° C. and under a sufficiently reduced pressure to separate off byproduct hydrogen sulfide, and recovering said triazole as the primary reaction product from the reaction mixture in a yield of about 87.7 to 99.5%.

4,082,764
METHODS FOR THE PRODUCTION OF 4H-s-TRIAZOLO[4,3-a][1,4]BENZODIAZEPINE 5N-OXIDES

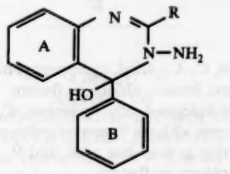
Yutaka Kuwada, Ashiya; Kanji Meguro, Takarazuka, and Hiroyuki Tawada, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 482,798, Jun. 24, 1974, Pat. No. 3,927,015, which is a continuation of Ser. No. 255,993, May 23, 1972, abandoned. This application Sep. 12, 1975, Ser. No. 612,745
Claims priority, application Japan, Jun. 5, 1971, 50/39700
Int. Cl.² C07D *487/04*
U.S. Cl. 260—308 R **3 Claims**

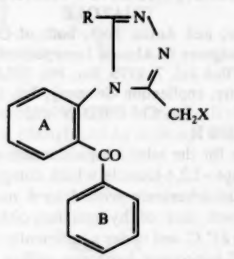
1. A method for the production of a compound of the formula



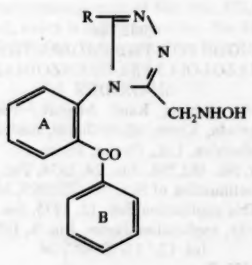
wherein R represents hydrogen or lower alkyl, and the rings A and/or B are unsubstituted or substituted by a member selected from the group consisting of halogen, nitro, trifluoromethyl, lower alkyl and lower alkoxy, which comprises reacting a compound of the formula



wherein R and the rings A and B have the same meanings as above, with a monohaloacetic acid halide or anhydride, to give a corresponding halogenoacetyl derivative, reacting the resulting halogenoacetyl derivative with a weak acid selected from the group consisting of formic acid, acetic acid, monochloroacetic acid, dichloroacetic acid, propionic acid, butyric acid, benzoic acid, salicyclic acid and phenylacetic acid, to give a compound of the formula



wherein R and the rings A and B have the same meanings as above, and X represents halogen, reacting the resulting compound with hydroxylamine to give a compound of the formula



wherein R and the rings A and B have the same meanings as above, and subjecting a solution of the resulting compound to a temperature from about 10° C to the reflux temperature of the solution to effect ring closure.

4,082,765

COMBATING INSECTS AND MITES WITH 1-CARBAMYL-4H-1,2,4-TRIAZOLIN-5-ONES AND THIONES

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Research & Development Co., Pittsburgh, Pa.

Division of Ser. No. 660,090, Feb. 23, 1976, which is a continuation-in-part of Ser. No. 508,476, Sep. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 295,318, Oct. 5, 1972, abandoned. This application May 16, 1977, Ser. No. 796,947

Int. Cl.[2] A01N *9/12, 9/22;* **C07D** *249/12, 401/04*

U.S. Cl. 260—308 C **36 Claims**

1. 3-tert.butyl-1-(N,N-dimethylcarbamyl)-4-methyl-4H-1,2,4-triazoline-5-thione.

4,082,766

PROCESS FOR PREPARING N-CHLOROPHTHALIMIDE

Ta-Sen Chou, and James R. Burgtorf, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 27, 1976, Ser. No. 690,471

Int. Cl.[2] C07D *209/34, 209/48*

U.S. Cl. 260—326 HL **9 Claims**

1. A process for preparing N-chlorophthalimide which comprises contacting an alkali metal salt of phthalimide with chlorine under substantially non-aqueous conditions in the presence of a halogenated aliphatic hydrocarbon and at a temperature of from about −10° C. to about +40° C.

4,082,767

PRODUCTION OF ALPHA-AMINO ACIDS

Takeshi Yamahara, Itami, and Shun Inokuma, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

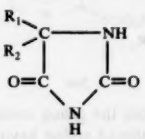
Filed Mar. 30, 1976, Ser. No. 671,984

Claims priority, application Japan, Apr. 3, 1975, 50-41010

Int. Cl.[2] C07C *99/08, 121/43;* **C07D** *209/20*

U.S. Cl. 260—326.14 T **9 Claims**

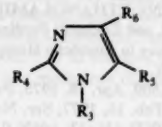
1. A process for preparing an α-amino acid, which comprises catalytically hydrolyzing a hydantoin compound of the formula (I)



(I)

wherein R_1 and R_2 are individually selected from the group consisting of (1) hydrogen, (2) C_1 - C_6 alkyl which may be unsubstituted or substituted by C_1 - C_2 alkoxy, hydroxyl, C_1 - C_2 alkylthio, mercapto, carbonyl, carboxyl, amino, cyano or indolyl, (3) C_5 - C_7 cycloalkyl which may be unsubstituted or substituted by C_1 - C_2 alkoxy, hydroxyl, carbonyl or C_1 - C_2 alkylthio, (4) C_2 - C_6 alkenyl, having one double bond in the molecule, which may be unsubstituted or substituted by C_1 - C_2 alkoxy, hydroxyl or carbonyl, (5) C_7 - C_9 aralkyl which may be unsubstituted or substituted by C_1 - C_2 alkoxy, hydroxyl, C_1 - C_2 alkylthio or mercapto, and (6) C_6 - C_8 aryl which may be unsubstituted or substituted by C_1 - C_2 alkoxy, hydroxyl, C_1 - C_2 alkylthio or mercapto,

in admixture with, as catalyst, (A) an imidazole compound of the formula (II)



(II)

wherein R_3 is selected from the group consisting of (1) hydroge, (2) $C_1 - C_5$ alkyl which may be unsubstituted or substituted by carboxyl, amino, mercapto or hydroxyl, (3) $C_2 - C_5$ alkenyl which may be unsubstituted or substituted by amino, carboxyl, mercapto or hydroxyl, (4) $C_7 - C_9$ aralkyl which may be unsubstituted or substituted by amino, carboxyl, mercapto or hydroxyl, and (5) $C_6 - C_8$ aryl which may be unsubstituted or substituted by amino, carboxyl, mercapto or hydroxyl, and R_4, R_5 and R_6 are individually selected from the group consisting of halogen and the groups set forth above with respect to the definition of R_3, or (B) a compound containing the formula (II) in its molecule selected from the group consisting of a homopolymer of N-vinylimidazole, a homopolymer of 5-vinylimidazole, a homopolymer of polyvinylimidazole, a copolymer of vinylimidazole and an acrylic ester, a copolymer of vinylimidazole, an acrylic ester and vinyl acetate, a copolymer of vinylimidazole and divinylbenzene, and a compound prepared by reacting a copolymer of 4-vinylpyridine and divinylbenzene with 2,4-dinitrochlorobenzene and further reacting the resultant compound with an amine.

4,082,768

NEW IMIDES OF UNSATURATED DICARBOXYLIC ACIDS, PROCESSES FOR THEIR MANUFACTURE, AND THEIR USE

Alfred Renner, Munchenstein, and Theobald Haug, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 381,328, Jul. 20, 1973, Pat. No. 3,960,812. This application May 19, 1976, Ser. No. 687,791

Int. Cl.[2] C07D *403/112, 403/14*

U.S. Cl. 260—326.26 **3 Claims**

1. A bis-imide or tris-imide selected from the group consisting of the N,N′-bis-maleimide of 4,4′-diaminotriphenyl phosphate, the N,N′-bis-citraconimide of 4″-tertbutyl-4,4′-diaminotriphenyl phosphate, the N,N′-bis-maleimide of 3,3′-diamino-3″-dimethylaminotriphenyl phosphate, the N,N′-bis-itaconimide of bis-(4-aminophenyl)-bisphenylyl phosphate, the N,N′-bis-maleimide of bis-(4-aminophenyl)-2-naphthyl phosphate, the N,N′,N″-tris-maleimide of tris(4-aminophenyl) phosphate, the N,N′,N″-tris-citraconimide of tris-(4-aminophenyl)phosphate, the N,N′-bis-maleimide of 4,4′-diaminotriphenyl phosphite, the N,N′-bis-maleimide of diaminotriphenyl thiophosphate, the N,N′,N″-tris-maleimide of tris-(4-aminophenyl) phosphite, the N,N′,N″-tris-maleimide of tris-(4-aminophenyl) thiophosphate and the N,N′,N″-trismaleimide of tris-(4-aminophenyl) thiophosphate.

4,082,769

BENZOTHIOXANTHENES

Otto Fuchs, Frankfurt am Main, and Helmut Troster, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

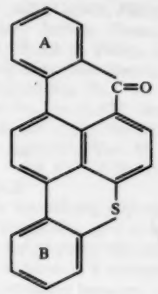
Filed Feb. 25, 1977, Ser. No. 772,269

Claims priority, application Germany, Feb. 27, 1976, 2607966

Int. Cl.[2] C07D *335/04*

U.S. Cl. 260—328 **13 Claims**

1. A compound of the formula



I

in which the nuclei marked A and B can be substituted by halogen, alkyl or alkoxy of 1 to 6 carbon atoms or phenyl.

4,082,770

BENZO(B)THIOPHENE DERIVATIVES

Peter Johannes Stoss, Wildtal; Manfred Franz Reinhold Herrmann, Gundelfingen, and Gerhard Satzinger, Denzlingen, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

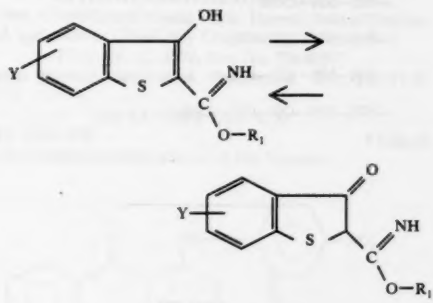
Division of Ser. No. 685,600, May 12, 1976, Pat. No. 4,018,793, which is a division of Ser. No. 566,469, Apr. 9, 1975, Pat. No. 3,971,814, which is a division of Ser. No. 419,305, Nov. 27, 1973, Pat. No. 3,907,826. This application Apr. 8, 1977, Ser. No. 785,809

Claims priority, application Germany, Nov. 27, 1972, 2258036

Int. Cl.[2] C07D *333/64*

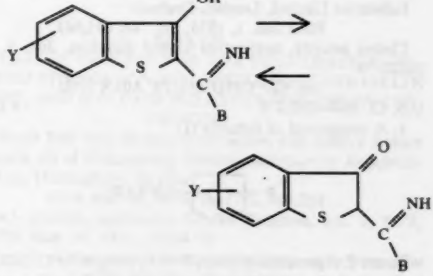
U.S. Cl. 260—330.5 **2 Claims**

1. A compound of the formula:



wherein Y is hydrogen; and R_1 is $-C_6H_{11}$.

2. A compound of the formula:



wherein Y is hydrogen; and B is selected from the group consisting of

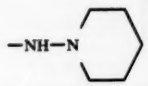
—NH C_5H_{11}

—$NH(CH_2)_2C_6H_5$

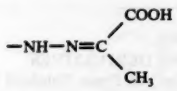
—NHOH

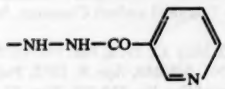
—NH—NHC_6H_5

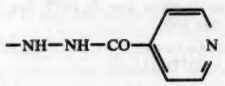
—NH—$H(CH_3)_2$



—NH—N=C—$(CH_3)_2$







—NH—NH—COH

—NH—NH—CO—CH_3

—NH—NH—CO—C_6H_5

—NH—NH—CO—CH_2—C_2H_5.

4,082,771

ACYLAMINO DERIVATIVES

Delme Evans, Chalfont St. Peter; Michael Ralph John Jolley, Camberley; William James Ross, Lightwater, and Brian Picton Swann, Camberley, all of England, assignors to Lilly Industries Limited, London, England

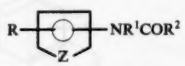
Filed Jun. 1, 1976, Ser. No. 691,961

Claims priority, application United Kingdom, Jun. 5, 1975, 24223/75

Int. Cl.[2] C07D *333/24;* A01N *9/00*

U.S. Cl. 260—332.2 R **4 Claims**

1. A compound of formula (I):



wherein Z represents sulphur; R is hydrogen, or C_{1-4} alkyl; R^1 is C_{1-7} alkyl, C_{3-6} alkenyl, or C_{3-6} alkynyl and R^2 is C_{3-10} cycloalkyl.

4,082,772

THIOPHENE ETHANOLAMINES

Jehan F. Bagli, Kirkland, and Eckhardt Ferdinandi, St. Laurent, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 569,509, Apr. 18, 1975, Pat. No. 4,024,156. This application Feb. 16, 1977, Ser. No. 768,937

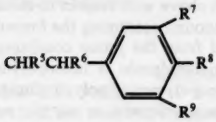
Int. Cl.[2] C07D *333/32;* A01N *9/00*

U.S. Cl. 260—332.3 H **6 Claims**

1. A compound of the formula

$ArCHOR^1CHR^2NR^3R^4$

in which Ar is selected from the group consisting of 2-thienyl, 5-(lower alkyl)-2-thienyl, 5-phenyl-2-thienyl and 4,5-dichloro-2-thienyl; R^1 is hydrogen or lower alkyl; R^2 is hydrogen or lower alkyl; R^3 is hydrogen or lower alkyl; and R^4 is a substituted phenethyl of the formula



wherein R^5 is hydrogen or lower alkyl, R^6 is hydrogen or hydroxy, R^7 and R^8 are joined to form a methylenedioxy radical and R^9 is hydrogen; and the acid addition salts thereof with pharmaceutically acceptable acids.

4,082,773

TRICYCLIC TETRAHYDRO NAPHTHALENEOLS AND RELATED COMPOUNDS

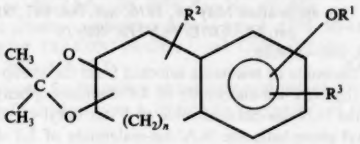
Frederic Peter Hauck, Somerville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 3, 1972, Ser. No. 268,300

Int. Cl.[2] C07D *317/46;* A61L *1/00*

U.S. Cl. 260—340.5 R **2 Claims**

1. A compound having the structure:



wherein R^1 is hydrogen, aryl-lower alkyl, or acyl; R^2 is hydrogen, lower alkyl, or aryl-lower alkyl; R^3 is hydrogen, acyl, lower alkyl, aryl-lower alkyl, lower alkoxy having up to 8 carbon atoms, carboxy, halo, alkenyl having 3 to 8 carbon atoms, nitro, cycloalkyl having 3 to 6 carbon atoms, amino, acylamino, $R^2O(CH_2)_n$,2 wherein R^2 is as defined above, and n^2 is 0, 1 or 2, or dihydroxy-lower alkyl; and n is 0, 1 or 2; wherein the term lower alkyl refers to alkyl groups having up to 8 carbon atoms; wherein the term acyl refers to acyl groups derived from carboxylic acids having up to 15 carbon atoms; and wherein the term aryl refers to phenyl or phenyl substituted with lower alkyl, halogen, nitro or methoxy.

4,082,774

METHYLENEDIOXYBENZENE -- IMPROVED METHOD OF PREPARATION

John A. Kirby, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 11, 1974, Ser. No. 487,490

Int. Cl.[2] C07D *317/50*

U.S. Cl. 260—340.5r **9 Claims**

1. In the process wherein the dianion of catechol is reacted with a methylene dihalide under alkaline conditions to form

methylenedioxybenzene, the improvement which comprises conducting said reaction under protic alkaline conditions by adding the dianion in a heated medium comprising one volume of water and about 1 to 10 volumes of dimethyl sulfoxide to a heated solution of a methylene dihalide in dimethyl sulfoxide.

4,082,775

PREPARATION OF D, L-PANTOLACTONE

Pierre Couderc, Bethune, and Serge Hilmoine, Aire sur la Lys, both of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Jul. 1, 1976, Ser. No. 701,586
Claims priority, application France, Jul. 7, 1975, 75 21270
Int. Cl.² C07D *307/32*
U.S. Cl. 260—343.6 2 Claims

1. In a process for the preparation of D, L- pantolactone by the reaction of hydroxypivaldehyde with hydrocyanic acid produced in situ to yield cyanohydrin, subsequent hydrolysis in a high acid medium of the cyanohydrin to produce pantolactone and separation and purification of the pantolactone, the improvement comprising:

(a) using isoamyl alcohol as a single solvent during both reactions;

(b) using a temperature of between 10 and 20° C and pH of 8.2 to 9.2 for the reaction of hydroxypivaldehyde with hydrocyanic acid produced in situ with the pH being adjusted within that range by the addition of hydrochloric acid at the same time as the addition of alkaline cyanide, said additions being carried out over a period of between approximately 60 and 70 minutes to provide an excess of approximately 10% hydrocyanic acid with respect to the stoichiometry of said reaction; and

(c) the acid hydrolysis reaction being carried out with an excess of concentrated hydrochloric acid at a temperature of 100° to 105° C and for a period of between about 20 and 30 minutes.

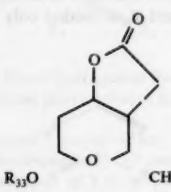
4,082,776

6-ALKOXY-4α-HYDROXY-2β-TETRAHYDROPYRANACETIC ACID γ-LACTONES

Robert C. Kelly, Kalamazoo, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,890, Apr. 14, 1976, Pat. No. 4,020,173. This application Feb. 22, 1977, Ser. No. 770,817
Int. Cl.² C07D *493/04*
U.S. Cl. 260—343.6 2 Claims

1. A thromboxane intermediate of the formula



wherein R_{33} is alkyl of one to 5 carbon atoms, inclusive.

4,082,777

GLYCIDOL PROCESS

Warren C. Fisher, Darien, Conn.; Seymour M. Linder, Baltimore, Md.; Ralph L. Pelley, Linthicum Heights, Md., and Hsiang-Peng Liao, Glen Burnie, Md., assignors to FMC Corporation, Philadephia, Pa.

Continuation of Ser. No. 41,675, May 22, 1970, which is a continuation-in-part of Ser. No. 519,841, Jan. 11, 1966, abandoned. This application Feb. 19, 1976, Ser. No. 659,451
Int. Cl.² C07D *301/14*
U.S. Cl. 260—348.25 4 Claims

1. A process for epoxidizing allyl alcohol to produce glycidol in high yields comprising (a) in a reaction zone, epoxidizing allyl alcohol at a temperature between 25° and 100° C., with peracetic acid in solution in a substantially anhydrous, inert, organic solvent containing between 5 to 40% peracetic acid, the ratio of allyl alcohol to peracetic acid being more than 1 and less than 5 until at least 70 to about 95% of the peracetic acid is reacted to produce a reaction mixture containing glycidol, allyl alcohol, peracetic acid, co-product acetic acid and said solvent; (b) removing the reaction mixture from the reaction zone; (c) diluting the reaction mixture with a diluent and (d) subjecting the diluted reaction mixture to a sequence of continuous fractional distillations at reduced pressure to rapidly and continuously separate (A) said solvent overhead and (B) then separate (1) a mixture of co-product acetic acid with allyl alcohol from (2) a mixture of glycidol and said diluent said solvent being more volatile in said distillations than said diluent aad said mixture (1) being more volatile in said distillations than said mixture (2), said solvent having a boiling point in the range of about 45 to 180° C. and said diluent being xylene, monochlorobenzene, ethylbenzene, pseudocumene or diisobutylketone.

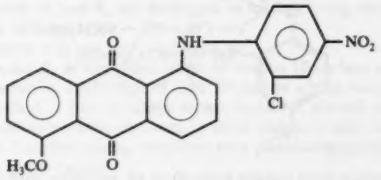
4,082,778

ARYLAMINOANTHRAQUINONES

Max Jost, Oberwil, and Arnold Wick, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 12, 1976, Ser. No. 704,609
Claims priority, application Switzerland, Jul. 23, 1975, 9622/75
Int. Cl.² C09B *1/16, 1/50*
U.S. Cl. 260—378 4 Claims

1. An arylaminoanthraquinone of the formula



4,082,779

ACYLATION PROCESS FOR THE PREPARATION OF STEROID PHENOLIC N-DISUBSTITUTED CARBAMATE ESTERS, AND ION PAIR SOLUTION FOR USE IN THE PROCESS

Hans Jacob Fex; Sten Krister Kristensson, and Anders Robert Stamvik, all of Helsingborg, Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

Filed Jun. 24, 1976, Ser. No. 699,216
Claims priority, application United Kingdom, Jul. 7, 1975, 28604/75; Mar. 17, 1976, 10824/76
The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.
Int. Cl.² C07J *1/00*
U.S. Cl. 260—397.5 11 Claims

1. An organic solvent solution containing an ion-pair consist-

ing of a quaternary ammonium or phosphonium cation and the anion of a phenolic estra-1,3,5(10)-triene, diphenyl-substituted ethane, or diphenyl-substituted ethene.

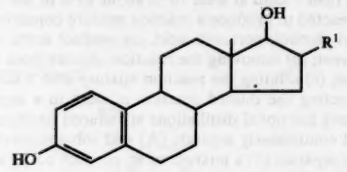
10. Tetraalkyl ammonium estra-1,3,5(10)-trien-17β-ol-3-olate or a 17α-ethynyl derivative thereof.

4,082,780
ESTRADIOL DERIVATIVES

Takuichi Miki, Amagasaki; Kentaro Hiraga, Nagaokakyo, and Giichi Goto, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 22, 1976, Ser. No. 744,185
Claims priority, application Japan, Nov. 27, 1975, 50-142509
Int. Cl.[2] C07J *1/00*
U.S. Cl. 260—397.5 15 Claims

1. A compound of the formula



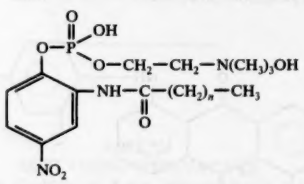
wherein R^1 is an alkyl group of two to four carbon atoms, allyl, or 3-butenyl.

4,082,781
SYNTHESIS OF 2-ALKANOYLAMINO-4-NITROPHENYL PHOSPHORYLCHOLINE-HYDROXIDE

Andrew E. Gal, Vienna, Va., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

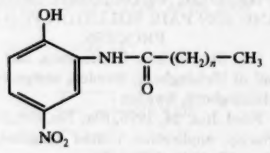
Filed Jun. 4, 1976, Ser. No. 692,915
Int. Cl.[2] A23J *7/00*; C07F *9/02*
U.S. Cl. 260—403 10 Claims

1. A method for synthesizing a sphingomyelinase-specific chromogenic artificial substrate consisting of 2-alkanoylamino-4-nitrophenyl phosphorylcholine-hydroxide having the formula



wherein n is an integer from 10 to 18, inclusive, said method comprising the steps of:

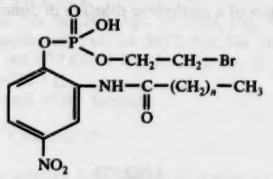
(a) reacting 2-amino-4-nitrophenol with a C_{12}–C_{20} alkanoyl halide to form a 2'-hydroxy-5'-nitroalkananilide having the formula



wherein n is an integer from 10 to 18, inclusive;

(b) alkalinizing said 2'-hydroxy-5'-nitroalkananilide to form the alkali phenolate salt thereof;

(c) phosphorylating said alkali phenolate salt with β-bromoethylphosphoryl dichloride and admixing the phosphorylation reaction products with water, thereby forming a precipitate comprising primarily a mono-alkananilide phosphoric acid ester having the formula



wherein n is an integer from 10 to 18, inclusive, and separating said precipitate from the reaction mixture mother liquor;

(d) extracting said mono-alkananilide phosphoric acid ester from said precipitate with sodium acetate buffer (pH 5.0);

(e) quaternizing said mono-alkananilide phosphoric acid ester by reacting it with trimethylamine, thereby forming a 2-alkanoylamino-4-nitrophenyl phosphorylcholine-bromide trimethylamine quaternary salt; and

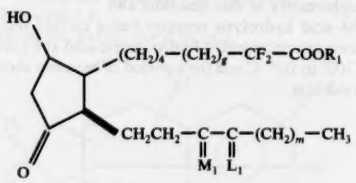
(f) treating said quaternary salt with a mixture of weak acidic and weak basic ion exchange resins to thereby convert it into said 2-alkanoylamino-4-nitrophenyl phosphorylcholine-hydroxide.

4,082,782
13,14-DIHYDRO-PGD$_1$, ANALOGS

Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184. This application Dec. 30, 1976, Ser. No. 756,098
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—408 49 Claims

1. A prostaglandin analog of the formula



wherein g is one, 2, or 3;

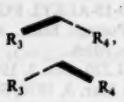
wherein M_1 is

or

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

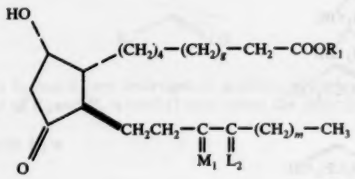
wherein L_1 is

or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein m is one to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

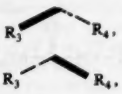
19. A prostaglandin analog of the formula



wherein g is one, 2, or 3;
wherein M_1 is

or

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_2 is

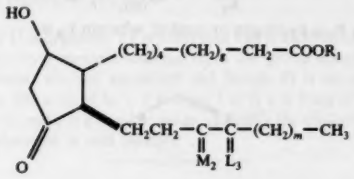


or a mixture of

and

wherein R_3 and R_4 are hydrogen or fluoro, being the same or different, with the proviso that at least one of R_3 and R_4 is fluoro;
wherein m is one to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substitutes with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

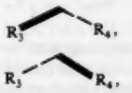
30. A prostaglandin analog of the formula



wherein g is one, 2, or 3;
wherein M_2 is

or

wherein L_3 is

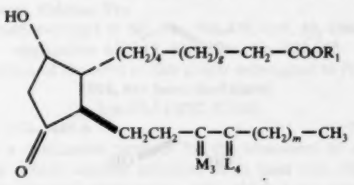


or a mixture of

and

wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein m is one to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

37. A prostaglandin analog of the formula



wherein g is one, 2, or 3;
wherein M_3 is

or

wherein R_5 is hydrogen or methyl; wherein L_4 is

or a mixture of

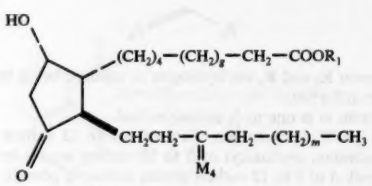
and

wherein R_3 and R_4 are hydrogen or methyl, being the same or different, with the proviso that one of R_3 and R_4 is methyl;

wherein *m* is one to 5, inclusive; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

48. A prostaglandin analog of the formula



wherein *g* is one, 2, or 3;

wherein M_4 is

or

wherein *m* is one to 5; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

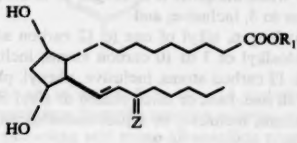
4,082,783

2A,2B-DIHOMO-15-ALKYL PGF$_1\alpha$ ANALOGS

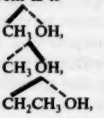
Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 511,220, Oct. 2, 1974, Pat. No. 3,974,195.
This application Mar. 3, 1976, Ser. No. 663,362
Int. Cl.^{2} C11C *3/02*
U.S. Cl. 260—410.9 R **7 Claims**

1. An optically active compound of the formula:



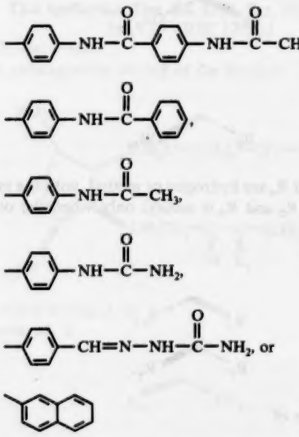
wherein Z is



or

and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive,



or pharmacologically acceptable salts thereof when R_1 is hydrogen.

4. 2a,2b-Dihomo-15(S)-15-methyl-PGF$_{1\alpha}$, methyl ester, a compound according to claim **2**, wherein R_1 is methyl.

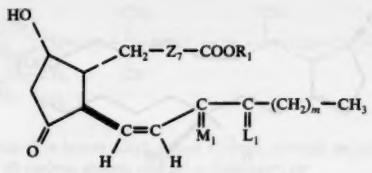
4,082,784

CIS-13-PGD$_1$ COMPOUNDS

Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184.
This application Dec. 30, 1976, Ser. No. 756,099
Int. Cl.^{2} C07C *177/00*
U.S. Cl. 260—413 **9 Claims**

1. A prostaglandin analog of the formula



wherein m is one to 5, inclusive;
wherein M_1 is

or

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one of 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_7 is;
(1) $-(CH_2)_3-(CH_2)_g-CF_2-$, or
(2) $-(CH_2)_3-(CH_2)_g-CH_2-$,
wherein g is one, 2, or 3.

4,082,785

MANUFACTURE OF ACRYLONITRILE FROM PROPYLENE, AMMONIA AND OXYGEN

Vittorio Fattore, and Bruno Notari, both of San Donato Milanese, Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Jan. 25, 1972, Ser. No. 220,712
Claims priority, application Italy, Jan. 25, 1971, 19723 A/71
Int. Cl.[2] C07C *120/14*
U.S. Cl. 260—465.3 **4 Claims**

1. A process for the manufacture of acrylonitrile characterized in that a mixture of propylene, ammonia and oxygen or a gas containing molecular oxygen is contacted in the presence of a catalyst, in a fixed or fluidized bed, at a temperature between 300° C and 550° C, said catalyst consisting essentially of a catalytic mixture of oxygen containing compounds represented by the empirical formula:

$$U_a Te_b Mo_c Me_d O_e$$

wherein U is uranium, Te is tellurium, Mo is molybdenum, Me is an activator element selected from the group consisting of phosphorus, arsenic, antimony and boron, O is oxygen and wherein, for *a* equal to 1, *b* is from 1 to 8, *c* is from 0.1 to 0.5, *d* is 0 to 5, and *e* is a number taken to satisfy the oxidation state of the elements in said catalyst.

4,082,786

PROCESS OF PRODUCTION OF AROMATIC NITRILES

Masao Saito; Mamoru Onozawa; Kaoru Sasagawa, and Takamasa Kawakami, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 11, 1976, Ser. No. 741,114
Claims priority, application Japan, Dec. 16, 1975, 50-149884
Int. Cl.[2] C07C *120/14*
U.S. Cl. 260—465 C **15 Claims**

1. In a process for producing aromatic nitriles by subjecting a mixture of an aromatic hydrocarbon, ammonia and molecular oxygen to fluid catalytic reaction in the presence of a fluid catalyst, the improvement characterized by filling cylindrical wire netting (wire netting rings) into a fluidized bed reactor.

4,082,787

METHYL ISOCYANATE PROCESS

Robert James Bassett, Hockessin; Walter John Cordes, and Julius Jakob Fuchs, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 3, 1977, Ser. No. 756,554
Int. Cl.[2] C07C *118/00*
U.S. Cl. 260—453 P **24 Claims**

1. A process for making methyl isocyanate comprising thermally dehydrochlorinating a solution of methyl carbamyl chloride in an aprotic non-polar solvent at a temperature above the boiling point of methyl carbamyl chloride; initially condensing the reaction gases thereby formed at a temperature above the boiling point of methyl isocyanate so as to liquify at least part of the gases which are condensable at said temperature and thereby provide an initial liquid condensate consisting essentially of a solution of methyl isocyanate and methyl carbamyl chloride in said solvent wherein the ratio of methyl isocyanate to methyl carbamyl chloride is greater than it is in said reaction solution; separating said initial liquid condensate from the gases remaining after said initial condensation; separating methyl isocyanate from said initial condensate; and separating HCl from said remaining gases.

4,082,788

ESTERIFICATION AND EXTRACTION PROCESS

Samuel S. Mims, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Continuation-in-part of Ser. No. 766,476, Oct. 10, 1968. This application Aug. 19, 1969, Ser. No. 851,445
The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.
Int. Cl.[2] C07C *67/48*
U.S. Cl. 260—465.4 **7 Claims**

1. In a continuous process for the treatment of aqueous solutions which contain mixtures of at least two difficultly separable aliphatic carboxylic acids which have appreciable water solubility and which are convertible to extractable esters, the improved process which comprises:
(a) continuously contacting said aqueous solution with a water-miscible esterifying liquid selected from the group consisting of lower alkyl alcohols, alkylene glycols, their ether derivatives and mixtures thereof, at a temperature of from 25° C. to the boiling point of the solvent used and in

a sufficient amount to esterify at least two of the aliphatic acids present and in the presence of an esterification catalyst to form an esterifying mixture;

(b) continuously contacting said esterifying mixture countercurrently simultaneously with the esterification reaction, with a substantially water-immiscible organic solvent selected being from the group consisting of aromatic hydrocarbons, aliphatic hydrocarbons, halogenated aliphatic hydrocarbons, halogenated aromatic hydrocarbons, cycloaliphatic hydrocarbons and mixtures thereof, in a sufficient amount to extract the esters formed into said organic solvent substantially as they are formed; said countercurrent contact being carried out by passing said esterifying mixture into at least one extractor and passing said organic solvent into at least one said extractor countercurrent to said esterifying mixture and continuing said contact for a sufficient time to extract the esters formed into said organic solvent; (c) removing the resulting mixture from the said at least one extractor, passing to at least one settler and permitting the mixture to layer out and form an organic phase and an aqueous phase, said organic phase containing esters of the said aliphatic acids dissolved in said water-immiscible organic solvent and said aqueous phase containing water, any excess water-miscible esterifying liquid, any unesterified aliphatic acids and esterification catalysts;

(d) separating said organic phase and said aqueous phase and passing said organic phase and aqueous phase to separate distillation stages;

(e) distilling said organic phase to remove the water-immiscible organic solvent and recycling said organic solvent to at least one of said extractors, and recovering the organic esters of the aliphatic acids;

(f) distilling the aqueous phase to remove any excess water-miscible esterifying liquid and any unesterified aliphatic acids;

(g) recycling said water-miscible esterifying liquid and unesterified aliphatic acids to the initial esterification step.

4,082,789
PROSTAGLANDINS C_2

Robert L. Jones, Edinburgh, Scotland, assignor to The University Court of the University of Edinburgh, Edinburgh, Scotland

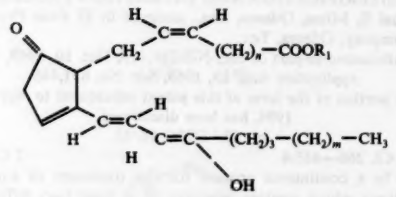
Continuation of Ser. No. 510,076, Sep. 27, 1974, abandoned, which is a continuation of Ser. No. 345,347, Mar. 27, 1973, abandoned. This application Mar. 1, 1976, Ser. No. 662,637

Claims priority, application United Kingdom, Mar. 28, 1972, 14520/72; May 17, 1972, 23135/72

Int. Cl.[2] C07C *177/00*; C11C *1/00*

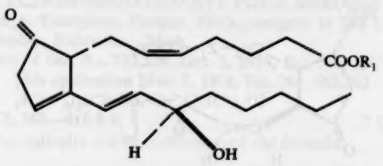
U.S. Cl. 560—121 **9 Claims**

1. An optically active compound of the formula:



wherein m is 0, 1, 2, or 3 and n is 2, 3, 4, or 5, and wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

6. An optically active compound of the formula:



wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,082,790
METHOD OF PREPARING MERCAPTANS

John L. Speier, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 531,831, Dec. 11, 1974, abandoned. This application Mar. 10, 1975, Ser. No. 557,214

Int. Cl.[2] C07F *7/08, 7/18*

U.S. Cl. 260—448.8 R **10 Claims**

1. A method of producing mercaptans which comprises reacting (A) a halide of the formula RX_a with a mixture of (B) ammonia or a hydrocarbyl amine containing one N atom, no more than 6 carbon atoms and being free of aliphatic unsaturation and having a K_a of less than 1×10^{-9} in aqueous solution, and H_2S, in the mole ratio of at least one mole of H_2S and one mole of (B) per mole of halogen in (A), at a temperature of from 0° to 175° C. under autogenous pressure whereby a compound of the formula

$R(SH)_a$ is formed, in which process

R is selected from the group consisting of aliphatic, cycloaliphatic or aralkyl hydrocarbon radicals free of aliphatic unsaturation, such hydrocarbon radicals substituted with alkoxy, keto, carboxy, hydroxyl, —$COOR^3$ or —$OOCR^3$ radicals in which R^3 is a monovalent hydrocarbon radical free of aliphatic unsaturation, and silylated hydrocarbon radicals of the formula $(R''O)_yR'''_{3-y}SiR^4$— or $(O_{3-d/2})R'''_dSiR^4$— in which

R'' is an alkyl or an alkoxyalkyl radical of 1 to 6 carbon atoms,

R''' is a monovalent hydrocarbon radical free of aliphatic unsaturation, a haloaryl radical or $R_fCH_2CH_2$— in which R_f is a perfluoroalkyl radical,

R^4 is a divalent, trivalent or tetravalent, aliphatic, cycloaliphatic or aralkyl hydrocarbon radical free of aliphatic unsaturation,

y is 1 to 3 and

d is 0 to 2,

X is bromine or chlorine, and

a is 1 to 3.

4,082,791
INTERMEDIATES FOR VITAMIN A

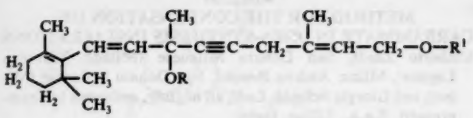
William Oroshnik, Plainfield, N.J., assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 566,982, Apr. 10, 1975, which is a division of Ser. No. 353,215, Apr. 23, 1973, Pat. No. 3,949,006, which is a continuation-in-part of Ser. No. 246,939, Apr. 24, 1972, abandoned. This application Feb. 17, 1976, Ser. No. 658,186

Int. Cl.[2] C07C *175/00*

U.S. Cl. 560—260 **5 Claims**

1. A compound having the formula:



in which R is lower alkyl, lower alkenyl, phenyl, or aralkyl of up to 10 carbon atoms, and R^1 is hydrogen or

R^2 being lower alkyl, phenyl or aralkyl of up to 10 carbon atoms.

4,082,792

METHOD OF PREPARING SECONDARY ALKYLAMMONIUM 3-SECONDARY ALKYLAMINOALKANOATES

Jack H. Kolaian, Wappingers Falls; John A. Patterson, Fishkill, and Frank K. Ward, Hopewell Junction, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 494,590, Aug. 5, 1974, Pat. No. 3,976,682. This application Apr. 12, 1976, Ser. No. 676,024

Int. Cl.[2] C07C *101/24*

U.S. Cl. 260—501.11 **16 Claims**

1. A method of preparing a secondary alkylammonium 3-secondary alkylaminoalkanoate which comprises contacting a secondary alkyl primary amine or mixtures thereof having 6 to 25 carbon atoms and a 2-alkenoic acid having 3 to 9 carbon atoms in the presence of a primary or secondary alkanol having 1 to 10 carbon atoms at a temperature of from about 50° to 180° C. and a pressure of from atmospheric to 200 p.s.i.g. utilizing a mole ratio of acid to amine to alkanol of between about 1:1.3:2.0 and 1:3.0:20.

4,082,793

AROMATIC PHOSPHINIC ACIDS CONTAINING SULFONE LINKAGE

Piero L. Nannelli, King of Prussia, and Harold G. Monsimer, East Norriton, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1977, Ser. No. 767,095

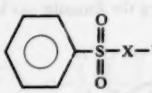
Int. Cl.[2] C07F *9/30*; C08G *79/04*

U.S. Cl. 260—502.4 R **68 Claims**

1. A phosphinic acid of the formula

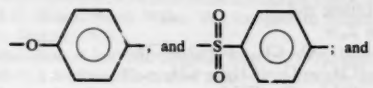
wherein

(a) R has the formula



(1) *x* is select from the group consisting of 3-phenylene and 4-phenylene, and

(2) *y* is select from the group consisting of a direct bond,



(b) R′ is selected from the group consisting of R, lower alkyl of from 1 to 3 carbon atoms, 4-biphenylyl, and phenyl.

4,082,794

INTER-OXA-PGD$_1$ COMPOUNDS

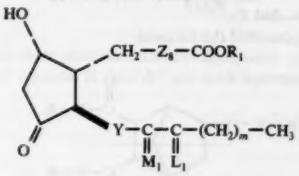
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184. This application Dec. 30, 1976, Ser. No. 755,987

Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—514 D **33 Claims**

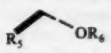
1. A prostaglandin analog of the formula



wherein Y is cis-CH=CH— or trans-CH=CH—;

wherein *m* is 1 to 5, inclusive;

wherein M_1 is



or

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to

3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein Z_8 is

(1) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,

(2) $-(CH_2)_2-O-(CH_2)_g-CH_2-$, or

(3) $-(CH_2)_3-O-(CH_2)_g-$,

wherein g is 1, 2, or 3.

4,082,795

PERFLUOROALKYLTHIO NORBORNANE COMPOUNDS

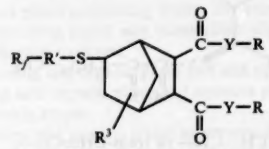
Neal O. Brace, Wheaton, Ill., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 608,932, Aug. 29, 1975, Pat. No. 3,989,725. This application Nov. 1, 1976, Ser. No. 737,363

Int. Cl.² C07C *61/32, 61/12*

U.S. Cl. 260—544 F **4 Claims**

1. A compound of the formula



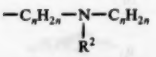
II

and an isomeric mixture thereof, wherein

R is a halogen

R′ is a divalent radical of the formula

$-C_nH_{2n}-$, $-C_nH_{2n}-S-C_nH_{2n}-$, $-C_nH_{2n}-O-C_nH_{2n}-$ or



where n is 1 to 12 and R^2 is hydrogen or alkyl of 1 to 6 carbon atoms, R_f is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by a perfluoroalkoxy group of 2 to 6 carbon atoms, and R^3 is hydrogen or methyl.

4,082,796

PROCESS FOR PREPARING CYANOFORMAMIDE

Wilhelm Riemenschneider, Frankfurt am Main, and Peter Wegener, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 19, 1975, Ser. No. 642,398

Claims priority, application Germany, Dec. 21, 1974, 2460779

Int. Cl.² C07C *51/44*

U.S. Cl. 260—545 R **12 Claims**

1. A process for preparing cyanoformamide which comprises reacting cyanogen with water in a catalyst solution at a temperature of 0° to 80° C. to form cyanoformamide, said solution containing one or more carboxylic acids selected from formic, acetic, propionic and butyric acids, from 0.025 to 1.0 moles per liter of copper(II) salt as a catalyst and water in an amount up to 5% by weight of said solution, adding water to said solution as the reaction proceeds while maintaining the molar ratio of water to cyanogen at a value no greater than 1:1, and recovering the cyanoformamide from said solution.

4,082,797

METHOD FOR THE CONDENSATION OF CARBAMMATE IN UREA-SYNTHESIS INSTALLATIONS

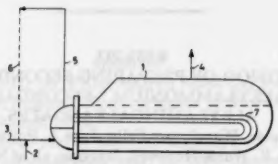
Umberto Zardi, San Donato Milanese (Milan); Vincenzo Lagana', Milan; Andrea Bonetti, San Donato Milanese (Milan), and Giorgio Schmid, Lodi, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Apr. 20, 1976, Ser. No. 678,635

Claims priority, application Italy, Apr. 23, 1975, 22615 A/75

Int. Cl.² C07C *126/00, 126/02*

U.S. Cl. 260—555 A **6 Claims**



1. A process for synthesizing urea which includes producing vapors of $NH_2 + CO_2 + H_2O$ through a high pressure distillation stage and feeding a mixture of said vapors and a carbonate solution which is rich in H_2O to a carbonate condenser provided with a jacket through which water is circulated for the recovery of the heat of condensation by the production of steam and having a condensation zone where said vapors are condensed to produce a carbamate solution for recycle to a urea reactor, wherein the improvement comprises forming said condensation zone of a horizontal-tube-bundle and maintaining said condensation zone under a static head (ΔP) in the range between 0.5 and 5 atmospheres.

4,082,798

PERFLUOROALKYLTHIO NORBORNANE COMPOUNDS

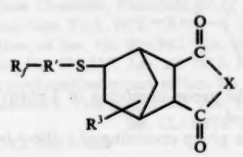
Neal O. Brace, Wheaton, Ill., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 608,932, Aug. 29, 1975, Pat. No. 3,989,725. This application Nov. 1, 1976, Ser. No. 737,866

Int. Cl.² C07C *103/19;* C07D *209/02*

U.S. Cl. 260—557 B **7 Claims**

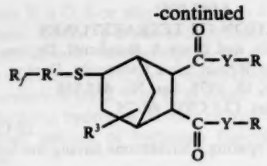
1. A compound having the formula



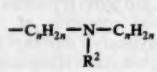
I

or

-continued



and an isomeric mixture thereof,
wherein
X is the group >NR,
Y is the group >NR,
R is independently hydrogen or alkyl of 1 to 24 carbons
R′ is a divalent radical of the formula $-C_nH_{2n}-$, $-C_nH_{2n}-S-C_nH_{2n}-$, $-C_nH_{2n}-O-C_nH_{2n}-$ or



where n is 1 to 12 and R^2 is hydrogen or alkyl of 1 to 6 carbon atoms, R_f is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by a perfluoroalkoxy group of 2 to 6 carbon atoms, and R^3 is hydrogen or methyl.

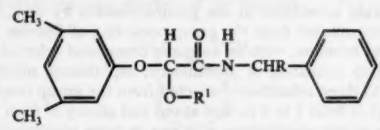
4,082,799

N-BENZYL-2-(3,5-DIMETHYL PHENOXY)-2-ALKOXY AMIDES AND THEIR USE AS HERBICIDES

Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 591,686, Jun. 30, 1975, Pat. No. 4,050,923. This application Jun. 13, 1977, Ser. No. 805,682
Int. Cl.² C07C *103/76*
U.S. Cl. 260—559 B **3 Claims**

1. Compounds of the formula



in which R is hydrogen or alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

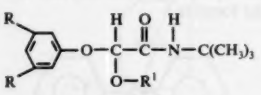
4,082,800

N-T-BUTYL-2-(3,5-DICHLORO OR DIMETHYL PHENOXY)-2-ALKOXY AMIDES AND THEIR USE AS HERBICIDES

Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 591,687, Jun. 30, 1977, Pat. No. 4,049,424. This application Jun. 13, 1977, Ser. No. 805,683
Int. Cl.² C07C *103/76*
U.S. Cl. 260—559 B **5 Claims**

1. Compounds of the formula



in which R is halogen or alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

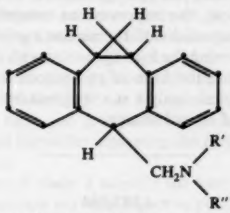
4,082,801

4-AMINOMETHYLDIBENZOBICYCLO[5.1.0]OCTANES

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 309,832, Nov. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 827,038, May 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 663,930, Aug. 24, 1967, abandoned. This application Oct. 1, 1976, Ser. No. 728,676
Int. Cl.² C07C *87/28*
U.S. Cl. 260—570.9 **3 Claims**

1. A compound of the formula:



and the non-toxic pharmaceutically acceptable acid addition salts thereof wherein R′ and R″ are each hydrogen or lower alkyl.

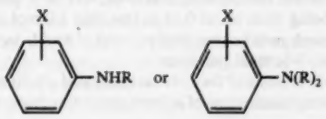
4,082,802

PROCESS FOR THE PREPARATION OF AROMATIC SECONDARY OR TERTIARY AMINO COMPOUNDS

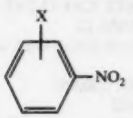
Masataka Nakagawa, Yamatotakada; Tadasu Iga, Suita, and Akira Fukura, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 134,071, Apr. 14, 1971, abandoned. This application Dec. 11, 1973, Ser. No. 423,702
Claims priority, application Japan, Apr. 28, 1970, 45-37013
Int. Cl.² C07C *91/16, 87/52*
U.S. Cl. 260—574 **5 Claims**

1. A process for producing aromatic secondary or tertiary amino compounds with the formula,



wherein X is a hydrogen atom, a methyl group or a methoxy group, and R is methyl, ethyl, n-propyl isopropyl, n-butyl, isobutyl or sec.-butyl, which comprises reacting hydrogen, an aromatic nitro compound of the formula,



wherein X is as defined above, and an alcohol of the formula, ROH

wherein R is as defined above, in the presence of a catalyst of copper chromite consisting essentially of copper chromite of the formula $CuOCuCr_2O_4$, or a catalyst of copper chromite consisting essentially of as a main ingredient copper chromite of the formula $CuOCuCr_2O_4$ and as a promoter at least one member selected from the group consisting of Fe, Ni, Ba, Mg and Mn.

4,082,803
PROCESS FOR PREPARING 4-CHLORO-?,5-DIMETHOXY ANILINE

Emmerich Paszthory, Hofheim, Taunus; Bernhard Mees, Konigstein, Taunus, and Ernst Hille, Rossert, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 24, 1975, Ser. No. 634,634
Claims priority, application Germany, Nov. 25, 1974, 2455704
Int. Cl.² C07C *93/14*
U.S. Cl. 260—575 **11 Claims**

1. In a process for the preparation of 4-chloro-2,5-dimethoxy-aniline by catalytic hydrogenation of 4-chloro-2,5-dimethoxy nitrobenzene, the improvement comprising comminuting the nitro compound until the median particle size is below 100 μ and performing the hydrogenation with the comminuted nitro compound in the form of an aqueous slurry and in the presence of a nickel catalyst at a temperature of 30° to 80° C and a pressure of 10 to 100 atms.

4,082,804
PROCESS FOR PREPARING 2-AMINO-1-BUTANOL BY REACTION OF THE TARTARATE WITH AN ALKALINE EARTH METAL COMPOUND

Yataro Ichikawa, Fuchu; Toru Sawaki, Iwakuni, and Yuitsu Honda, Kawasaki, all of Japan, assignors to Teijin Limited, Minamihonmachi, Japan

Filed Oct. 28, 1976, Ser. No. 736,683
Int. Cl.² C07C *89/04, 91/04*
U.S. Cl. 260—584 R **18 Claims**

1. In a method for the production of 2-amino-1-butanol by the reaction of the L-tartarate of 2-amino-1-butanol with an alkaline earth metal compound to produce a crystalline precipitate of the L-tartarate of the alkaline earth metal and a filtrate containing recoverable 2-amino-1-butanol, the improvement comprising:

gradually adding an aqueous slurry of the alkaline earth metal compound to said L-tartarate of 2-amino-1-butanol so as always to maintain said L-tartarate of 2-amino-1-butanol present in excess in the reaction system during the reaction, the rate of addition of said alkaline earth metal compound into contact with said L-tartarate of 2-amino-1-butanol being from about 0.15 to less than 1.0 mol of said alkaline earth metal compound per mol of said L-tartarate of 2-amino-1-butanol per hour,

to precipitate crystals of the L-tartarate of said alkaline earth metal having dimensions of at least about 40μ thick × 50μ long.

4,082,805
PRODUCTION OF ALIPHATIC AMINES UTILIZING A CRYSTALLINE ALUMINOSILICATE CATALYST OF ZSM-5, ZSM-11 OR ZSM-21

W. W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,069
Int. Cl.² C07C *85/02*
U.S. Cl. 260—585 B **10 Claims**

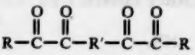
1. A process for the selective production of primary aliphatic amines over secondary and tertiary amines by reaction of an ether characterized by the formula R—O—R′ where R and R′ are independently alkyl of 2 to 5 carbon atoms, with ammonia in the presence of a crystalline aluminosilicate catalyst of ZSM-5, ZSM-11 or ZSM-21 at a temperature between about 300° and about 500° C; a pressure between about 14.7 and 1000 psig with the relative feed rates, expressed in grams per hour of (1) ether and (2) ammonia being within the range of 1:1 to 5:1.

4,082,806
PREPARATION OF TETRAKETONES

Frank W. Harris, Xenia, and Bruce A. Reinhardt, Dayton, both of Ohio, assignors to Wright State University, Dayton, Ohio

Filed Dec. 18, 1975, Ser. No. 641,958
Int. Cl.² C07C *49/76*
U.S. Cl. 260—590 D **10 Claims**

1. The method of preparing a tetraketone having the formula



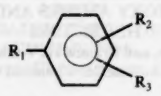
wherein R′ is selected from the group consisting of phenyl, diphenyl ether, diphenyl methane, pyridine, diphenyl sulfoxide, and xylene radicals and R is selected from the group consisting of phenyl, substituted phenyl, and pyridyl radicals from a diketone selected from the group consisting of 1,4-bis (phenylacetyl) benzene, 4,4′-bis(phenylacetyl) diphenyl ether, 1,3-diphenacylbenzene, 4,4′-bis(phenylacetyl)diphenylmethane, 2,6-diphenacylpyridine, 1,3-bis(2-pyridylacetyl) benzene, 4,4′-bis(phenylacetyl)diphenylsulfoxide, 1,3-bis(4-methylphenylacetyl)benzene, 1,4-bis(5-fluoro-2-nitrophenylacetyl)benzene, and α,α'-dibenzoyl-para-xylene, comprising oxidizing said diketone to said tetraketone with dimethylsulfoxide and a halogenating agent selected from the group consisting of cupric halide and hydrogen bromide.

4,082,807
PROCESS FOR THE MANUFACTURE OF AROMATIC 1,3-DIKETONES

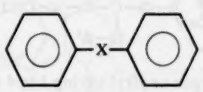
Kurt Eiglmeier, Idstein, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 491,476, Jul. 22, 1974, Pat. No. 3,937,737.
This application Jul. 30, 1975, Ser. No. 600,207
Claims priority, application Germany, Jul. 23, 1973, 2337396
Int. Cl.² C07C *49/76*
U.S. Cl. 260—590 R **12 Claims**

1. A process for the preparation of an aromatic 1,3-diketone which comprises reacting acetoacetylfluoride, or an acetoacetylfluoride substituted at the gamma-position by up to three halogens selected from the group consisting of fluorine, chlorine and bromine, with an aromatic compound selected from the group consisting of naphthalene; naphthalene substituted by up to three substituents selected from the group consisting of alkyl of from 1 to 4 carbon atoms and alkoxy of from 1 to 4 carbon atoms; naphthalene with one or more condensed rings thereon having in total up to 20 carbon atoms; naphthalene with one or more condensed rings thereon and substituted by up to three sustituents selected from the group consisting of alkyl of 1 of 4 carbon atoms and alkoxy of from 1 to 4 carbon atoms, having in total up to 20 carbon atoms; benzene of the formula



wherein R_1, $R_2$and R_3 each is hydrogen, alkyl of up to 12 carbon atoms, alkoxy of up to 12 atoms, alkylthio of up to 12 carbon atoms or benzyloxy or R_1 is phenyloxy, substituted phenyloxy, phenylthio, substituted phenylthio or halogen, or wherein R_1 and R_2 together form alkylene of 4 carbon atoms; diphenyl of the formula



wherein X is O, S or alkylene of up to 4 carbon atoms; dibenzofurane; dibenzo-p-dioxane; thiophene; monoalkylthiophene; dialkylthiophene; benzothiophene; 2,2' -dimethoxy diphenyl ether; 3-chloro-pyrene; and 2-anisyl-chloracetic acid ester, at a temperature of about −30°C. to about +20° C. in the presence of anhydrous hydrogen fluoride or hydrofluoric acid having a minimum amount of hydrogen fluoride of about 90% by weight.

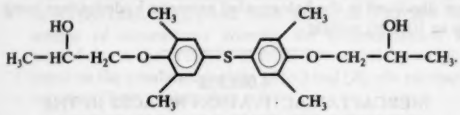
4,082,808

THIOBIS-2,6-DISUBSTITUTED PHENOL

Allan S. Hay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 484,995, Jul. 1, 1974, Pat. No. 3,953,519. This application Jan. 19, 1976, Ser. No. 650,011
Int. Cl.[2] C07C *149/36, 121/20, 43/20*
U.S. Cl. 260—609 F 2 Claims

1. A thiobisphenol of the formula:



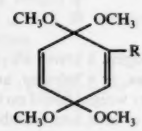
4,082,809

P-BENZOQUINONE DIKETALS

Rudolf Pistorius, Benniehausen, and Hans Millauer, Eschborn, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 642,397, Dec. 19, 1975. This application Apr. 19, 1977, Ser. No. 788,808
Claims priority, application Germany, Dec. 21, 1974, 2460754
Int. Cl.[2] C07C *41/00*
U.S. Cl. 260—611 R 2 Claims

1. p-Benzoquinone diketals of the formula



wherein R is an alkyl group having of from 1 to 4 carbon atoms, Cl or F.

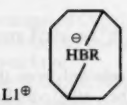
4,082,810

BULKY TRIALKYLBOROHYDRIDES

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich-Boranes, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 114,084, Feb. 9, 1971, abandoned. This application Oct. 16, 1975, Ser. No. 622,985
Int. Cl.[2] C07F *5/02*
U.S. Cl. 260—606.5 B 9 Claims

1. A borohydride of the formula:



wherein R is an alkyl group containing 3 to 6 carbon atoms and attached to the boron by a secondary or tertiary carbon atom.

4,082,811

RECOVERY OF METAL AND TRIARYLBORANE CATALYST COMPONENTS FROM OLEFIN HYDROCYANATION RESIDUE

Howard Everett Shook, Jr., Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 23, 1977, Ser. No. 771,064
Int. Cl.[2] C07F *5/02, 15/04;* C01C *31/11;* C07C *120/02*
U.S. Cl. 260—606.5 B 4 Claims

1. A process for the recovery of catalyst components from a catalyst residue which residue is obtained from the hydrocyanation of olefins using a catalyst comprising zero-valent nickel complex promoted with a triarylborane and comprises nickel cyanide, triarylborane and complexes of the foregoing, said process comprising contacting said residue with an aqueous solution containing at least 10 moles of nitrogen-containing base per mole of boron plus nickel while maintaining the concentration of said base at at least 6% to maintain the nickel in solution and to form and precipitate the basic adduct of said triarylborane and thereafter separating the precipitate from the resultant solution.

2. The process of claim 1 wherein the base is ammonia and the moles of ammonia per mole of boron plus nickel are maintained in the range 15–50.

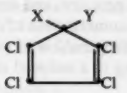
4,082,812

CHLORINATED CYCLOPENTADIENE PEROXIDES

Donald W. Wood, San Pablo, Calif., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,521
Int. Cl.[2] C07C *179/08;* A01N *9/24*
U.S. Cl. 260—610 R 5 Claims

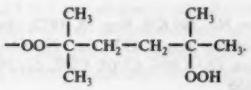
1. An organic peroxide of the formula



wherein X and Y are both selected from the same one of the following two subparagraphs:

(a) each of X and Y is the same and is a peroxy alkyl group of the structure —OOR in which R is a t-alkyl group of 4–8 carbon atoms;

(b) X is chlorine and Y has the structure



4,082,813

3-IODA-α-ETHYNYL BENZHYDROL

Edit Toth; Jozsef Törley; Sandor Gorög; Laszlo Szporny; Eva Palosi, and Szabolcz Szeberenyi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Division of Ser. No. 495,846, Aug. 8, 1974, Pat. No. 3,965,179. This application Nov. 10, 1975, Ser. No. 630,512
Claims priority, application Hungary, Aug. 15, 1973, RI 520
Int. Cl.[2] C07C *33/06*
U.S. Cl. 260—618 B 1 Claim

1. 3-iodo-α-ethynyl-benzyhydrol.

4,082,814

GROWTH INHIBITORS FOR MOSQUITO LARVAE

Leonard Jurd, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 594,168, Jul. 8, 1975, Pat. No. 3,973,040. This application Apr. 27, 1976, Ser. No. 680,644
Int. Cl.[2] C07C *39/12*
U.S. Cl. 260—619 R 3 Claims

1. The compound 2,6-di-t-butyl-4-cinnamylphenol.

4,082,815

ACYCLIC MONOOLEFIN DOUBLE-BOND ISOMERIZATION USING A NONACIDIC SUPPORTED NICKEL, IRON OR COBALT CATALYST WITH EITHER ANTIMONY OR ARSENIC

Marvin M. Johnson; Donald C. Tabler, and Gerhard P. Nowack, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 574,824, May 5, 1975, Pat. No. 4,020,119, which is a division of Ser. No. 390,799, Aug. 23, 1973, Pat. No. 3,900,526, which is a division of Ser. No. 249,726, May 2, 1972, Pat. No. 3,787,511, which is a division of Ser. No. 44,665, Jun. 8, 1970, Pat. No. 3,697,448, which is a continuation-in-part of Ser. No. 6,971, Jan. 29, 1970, abandoned. This application Nov. 5, 1976, Ser. No. 739,157
Int. Cl.[2] C07C *5/24*
U.S. Cl. 260—683.2 8 Claims

1. A method for the double bond isomerizatin of acyclic monoolefins without substantial hydrogenation of monoolefins which comprises contacting a feedstream containing acyclic monoolefins with hydrogen and a catalyst comprising a nonacidic support and a metal selected from the group consisting of nickel, iron, and cobalt and a material selected from the group consisting of antimony and arsenic under conditions including temperature, pressure, and contact time sufficient to cause the double bond isomerization of said acylic monoolefins without significant hydrogenation of said monolefins to saturates, said catalyst being in a reduced state.

4,082,816

CAPROLACTONE POLYMERS FROM UNSATURATED MONOMERS

William W. Fisk, and Howard J. Wright, both of Kansas City, Mo., assignors to Cook Paint and Varnish Company, Kansas City, Mo.

Division of Ser. No. 289,638, Sep. 18, 1972, abandoned. This application May 3, 1974, Ser. No. 466,845
Int. Cl.[2] C08G *63/08;* C08L *61/26*
U.S. Cl. 260—855 1 Claim

1. A process for preparing a composition comprising (a) a caprolactone-modified vinyl polymer and (b) a melamine-formaldehyde, said process comprising polymerizing caprolactone with a mixture of vinyl monomers including (1) from 60–98% by weight of a monomer selected from the group consisting of styrene, α-substituted lower alkyl styrenes, lower alkyl esters of acrylic and methacrylic acids, acrylonitrile, methacrylonitrile, acrylamide and mixtures thereof and (2) from 40–2% by weight of at least one monomer containing a —COOH and/or —OH group, the monomer containing said —COOH or —OH group being selected from the group consisting of hydroxy alkyl acrylates and methacrylates, acrylic acid, methacrylic acid, fumaric acid, crotonic acid, itaconic acid and maleic acid and the amount of caprolactone being in the range of 0.25–15 moles per —OH and —COOH equivalent in the monomer mixture and thereafter adding said melamine-formaldehyde to the resulting polymer.

4,082,817

PROCESS FOR PRODUCING MALEIC ANHYDRIDE ADDUCT OF HIGH MOLECULAR WEIGHT 1,2-POLYBUTADIENE

Fumitake Imaizumi; Isao Nagaoka; Mitsuo Kurokawa, all of Yokohama, and Koei Komatsu, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 554,151, Feb. 28, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 671,147
Claims priority, application Japan, Mar. 2, 1974, 49-24478
Int. Cl.[2] C08F *8/46*
U.S. Cl. 260—879 12 Claims

1. A process for producing a virtually gel free maleic anhydride adduct of high molecular weight 1,2-polybutadiene having a number average molecular weight of more than 10,000 and up to 200,000 and a crystallinity of up to 50%, consisting essentially in contacting maleic anhydride with said high molecular weight 1,2-polybutadiene at a reaction temperature of 50° to 260° C in the absence of a radical initiator in at least one halogenated aromatic hydrocarbon solvent thereby adding maleic anydride to the polymer, the concentration of the polymer dissolved in the halogenated aromatic hydrocarbon being up to 10% by weight.

4,082,818

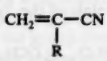
MERCAPTAN ACTIVATION BY ACID IN THE COPOLYMERIZATION OF ACRYLONITRILE

Gerald P. Coffey, Cleveland Heights, and Herbert F. Mazeke, Warrensville Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 17, 1976, Ser. No. 687,151
Int. Cl.[2] C08L *51/04;* C08F *4/00, 220/44*
U.S. Cl. 260—879 9 Claims

1. The process comprising polymerizing in an aqueous medium with a free radical generating polymerization initiator at a temperature of from about 0 to 100° C in the substantial absence of molecular oxygen 100 parts by weight of

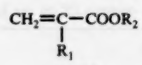
(A) from 60 to 90% by weight of at least one nitrile having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

(B) from 10 to 40% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of

(1) an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(2) an alpha-olefin having the structure

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

(3) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers,

(4) vinyl acetate, and

(5) styrene,

in the presence of from 0 to 40 parts by weight of

(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally a comonomer selected from the group consisting of styrene, a nitrile monomer having the structure

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-CN$$

wherein R has the foregoing designation, and an ester having the structure

$$CH_2=\underset{\displaystyle R_1}{\underset{|}{C}}-COOR_2$$

wherein R_1 and R_2 have the foregoing designations, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer wherein the polymerization is carried out in the presence of from 0.01 to 3% by weight based on the combined weight of (A) and (B) of a mercaptan at a pH no greater than 6.5.

4,082,819

RUBBER-MODIFIED ACRYLONITRILE-VINYL ETHER-INDENE POLYMERS

George S. Li, Aurora, Ohio, and Gary W. Dirks, Scottsdale, Ariz., assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 2, 1977, Ser. No. 773,531
Int. Cl.[2] C08F *279/02*
U.S. Cl. 260—879 **6 Claims**

1. The polymeric composition resulting from the polymerization of 100 parts by weight of

(A) from about 60 to 90% by weight of at least one nitrile having the structure

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

(B) from about 5 to 39% by weight of a vinyl ether having the structure

$$R_1CH=\underset{\displaystyle R_2}{\underset{|}{C}}-O-R_3$$

wherein R_1 and R_2 independently are hydrogen or a lower alkyl group having from 1 to 4 carbon atoms, and R_3 is an alkyl group having from 1 to 6 carbon atoms, and

(C) from about 1 to 15% by weight of at least one member selected from the group consisting of indene and coumarone

wherein the given percentages of (A), (B) and (C) are based on the combined weight of (A), (B) and (C), in the presence of from 1 to 40 parts by weight of

(D) a rubbery polymer of at least 50% by weight of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and up to 50% by weight of at least one member selected from the group consisting of styrene, acrylonitrile, and ethyl acrylate.

4,082,820

HIGH SOFTENING MALEIC ANHYDRIDE COPOLYMERS

George S. Li, Aurora, and Richard J. Jorkasky, II, Walton Hills, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 15, 1977, Ser. No. 806,576
Int. Cl.[2] C08F *279/02*
U.S. Cl. 260—879 **4 Claims**

1. The polymeric composition resulting from the polymerization of 100 parts by weight of

(A) from about 0 to 80% by weight of styrene,

(B) from about 1 to 50% by weight of maleic anhydride, and

(C) from about 1 to 60% by weight of indene,

wherein the given percentages of (A), (B) and (C) are based on the combined weight of (A) plus (B) plus (C), in the presence of from 1 to 40 parts by weight of

(D) a rubbery polymer of at least 50% by weight of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and up to 50% by weight of at least one member selected from the group consisting of styrene, alpha-methyl styrene, the vinyl toluenes, acrylonitrile, methacrylonitrile, ethyl acrylate, the propyl acrylates, the butyl acrylates, and the butyl methacrylates.

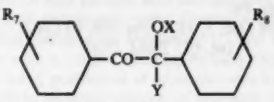
4,082,821

1-OXO-2-(PHOSPHONA)-1,2-DIPHENYLETHANES

Andreas Schmidt, Reinach, and Rudolf Kirchmayr, Munchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,230
Claims priority, application Switzerland, Dec. 24, 1974, 17285/74; Nov. 26, 1975, 15304/75
Int. Cl.[2] C07F *9/40*; C08F *2/50*
U.S. Cl. 260—946 **10 Claims**

1. A compound of formula I



(I)

wherein X represents hydrogen, alkyl of 1 to 4 carbon atoms, hydroxyalkyl of 2 to 3 carbon atoms, haloalkyl of 2 to 3 carbon atoms, alkoxyalkyl of 3 to 8 carbon atoms, alkenyl of 3 to 4 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, aralkyl of 7 to 8 carbon atoms, phenyl, halogenophenyl, alkylphenyl or alkoxyphenyl;

Y represents phosphonoalkyl of the formula $-CH(R_5)-CH(R_6)P(O)(OR_3)(OR_4)$ or phosphonoalkoxy of the formula $-O-(CH_2)_n-P(O)(OR_3)(OR_4)$;

each of R_3 and R_4 are independently represents alkyl of 1 to 4 carbon atoms, haloalkyl of 2 to 3 carbon atoms, alkoxyalkyl of 3 to 8 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, aralkyl of 7 to 8 carbon atoms, phenyl, halogenophenyl, alkylphenyl or alkoxyphenyl, or R_3 and R_4 together represent a branched or unbranched alkylene of 2 to 7 carbon atoms;

each of R_5 and R_6 independently represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl;

each of R_7 and R_8 independently represents hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen or phenyl; and

n is 2 or 3.

4,082,822

PREPARATION OF DITHIOPHOSPHORIC ACID ESTER DIHALIDES

Hans-Joachim Diehr, and Hermann Arold, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 12, 1976, Ser. No. 704,254
Claims priority, application Germany, Jul. 19, 1975, 2532396
Int. Cl.[2] C07F 9/20, 9/58, 9/65
U.S. Cl. 260—972 10 Claims

1. A process for the preparation of a dithiophosphoric acid ester dihalide of the formula

$$R-S-\overset{S}{\overset{\|}{P}}X_2$$

in which

X is chlorine, bromine, fluorine or iodine, and

R is an alkyl radical with up to 15 carbon atoms optionally substituted by halogen, by alkoxy or by alkylthio, a cycloaliphatic radical with 5 or 6 ring members, an aralkyl radical with 7 to 15 carbon atoms or an aryl or heterocyclic radical,

comprising reacting a thiol compound of the formula

$$R-SH$$

with a thiophosphoryl halide of the formula

$$PSX_3$$

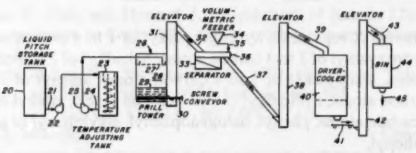
in the presence of a catalyst selected from the group consisting of a metal, an anhydrous metal halide, a Lewis acid, a nitrogen-alkylated lactam or an N,N-disubstituted carboxylic acid amide or phosphoric acid amide at a temperature of about 0° to 170° C.

4,082,823

PROCESS FOR FORMING COATED PITCH PRILLS

Harry G. Augustine; Kenneth C. Krupinski, both of Pittsburgh, and Frank A. Smith, Franklin Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1975, Ser. No. 637,262
Int. Cl.[2] B01J 2/06
U.S. Cl. 264—7 7 Claims



1. In a process for forming coated pitch prills useful as binders for making electrodes for use in electrochemical processes comprising

(a) forming droplets of molten pitch,

(b) rapidly cooling the liquid droplets to form prills by contacting the prills with an aqueous cooling bath,

(c) separating the prills from the cooling bath, and

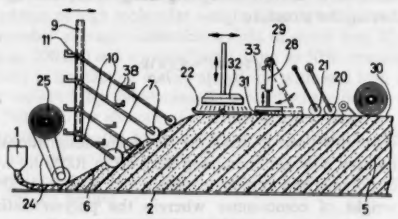
(d) drying the prills using heat and agitation, the improvement comprising following step (c) intimately mixing the prills which have been separated from the cooling bath while still wet with a finely divided carbonaceous material to produce a surface coating adherently bonded to the prills which resist caking or fusion of the prills at ordinary shipping and storage temperatures and pressures and which coating reduces the dusting tendency of the prill during handling.

4,082,824

METHOD OF PRODUCING CONTINUOUS PLANAR EXPANDED POLYURETHANE BLOCKS

Bernardo Del Carpio, Madrid, Spain, assignor to Planiblock, S.A., Madrid, Spain

Division of Ser. No. 514,275, Oct. 11, 1974, Pat. No. 3,984,195.
This application Mar. 4, 1976, Ser. No. 663,970
Claims priority, application Spain, Feb. 20, 1974, 423.434; Apr. 26, 1974, 425.717; May 27, 1974, 426.668
Int. Cl.[2] B29D 27/00
U.S. Cl. 264—46.3 9 Claims



1. A continuous free foam expansion process wherein a blowing gas is generated in a foamable resinous fluid comprising the steps of:

a. continuously depositing said foamable resinous fluid upon an inner mold lining;

b. continuously moving said inner mold lining and said foamable resinous fluid away from the place where it is deposited;

c. covering the top of said foamable resinous fluid with a gas impermeable separating material;

d. permitting said foamable resinous fluid to expand while moving away from the place where it is deposited;

e. applying mechanical pressure to the top of said foamable resinous fluid through said separating material during expansion;

f. said pressure being applied by pressure applying means at a plurality of fixed locations downstream of said place where said foamable resinous fluid is deposited and in the location where said expansion occurs and at each of said fixed locations said pressure being applied through means lying in a substantially straight line of contact transverse to the axis of the motion of said deposited fluid and in a plane rigid and fixed with respect to an axis taken along the transverse surface of said foamable resinous fluid and flexible in planes normal to said axis;

g. said pressure applying means at said plurality of fixed locations superposing substantially the entire transverse dimension of said foamable resinous fluid at least twice; and

h. permitting said foamable resinous fluid to expand to substantially its full dimension.

2. The method of claim 1 further comprising heating said separating material whereby adhesion between the separating material and said resultant foamed block is achieved.

4,082,825

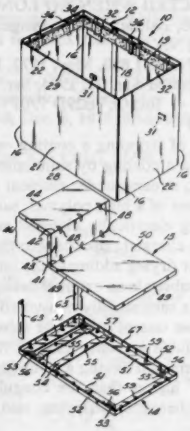
METHOD OF CONSTRUCTING A REFRIGERATION CABINET

Richard L. Puterbaugh, St. Cloud, Minn., assignor to Franklin Manufacturing Company, St. Cloud, Minn.

Division of Ser. No. 374,276, Jun. 27, 1973, Pat. No. 3,948,407.
This application Nov. 19, 1975, Ser. No. 633,433
Int. Cl.[2] B29D 27/04
U.S. Cl. 264—46.5 6 Claims

1. A method of constructing a refrigeration cabinet comprising the steps of wrapping a single sheet into a rectangular outer shell tube by joining two of its ends at a seam such that the single sheet forms four exterior walls of the cabinet, securing one end of the formed tube to an end wall and a rigid perimeter

frame to form a rigid box-like shell assembly, providing an open-faced, box-like liner having dimensions somewhat smaller than the corresponding dimensions of the shell tube assembly, positioning the liner in the shell tube assembly in spaced relationship to it and with its open face at the open end of the shell tube assembly opposite said one tube end, securing



a thermal breaker member to such shell and liner across the peripheral space between the shell and liner at their open ends, and injecting and foaming a rigid polyurethane insulation foam in place in the space between the liner and the shell assembly to secure said tube, end wall, liner and thermal breaker member together.

4,082,826

PROCESS FOR PRODUCING HIGHLY ION-CONDUCTIVE PORCELAIN

Sigeru Iijima, Nagoya, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed May 19, 1977, Ser. No. 798,719
Claims priority, application Japan, May 19, 1976, 51-57598
Int. Cl.[2] C04B *35/10*
U.S. Cl. 264—65 **10 Claims**

1. A process for producing a highly ion-conductive porcelain with a low specific resistivity not more than 10 ohm-cm at 300° C and with good stability in air, which comprises

(a) mixing about 87 to about 95% by weight of Al_2O_3 of a particle size of about 0.3 to about 5 microns with about 5 to about 13% by weight, as Na_2O, of a sodium salt of a particle size of about 5 to about 50 microns, wherein the sodium salt is a compound which decomposes to Na_2O at a temperature higher than about 700° C;

(b) heat-treating the mixture obtained in (a) at a temperature of about 900° to about 1500° C in an oxidizing atmosphere for a time of from about 10 minutes to about 7 hours to produce a powder which in the X-ray powder diffraction pattern has a β-Al_2O_3/β''-Al_2O_3 ratio such that the ratio of $I\beta$:$I\beta''$ is about 1.0 to about 0.25:1 where $I\beta$ is the peak intensity of β-Al_2O_3 in the (017) planes with d=2.69 A and $I\beta''$ is the peak intensity of β''-Al_2O_3 in the (01,11) planes with d=2.60 A in which d is the lattice distance;

(c) mixing 100 parts by weight of the resulting heat-treated powder obtained in (b) with 0.2 to about 3 parts by weight, as the oxide, of at least one compound capable of providing a monovalent or divalent metal ion, said ion increasing the ion conductivity of the sintered β-alumina in step (e) in combination with the Na ion in the alkaline atmosphere used in step (e);

(d) molding the mixture obtained in (c); and

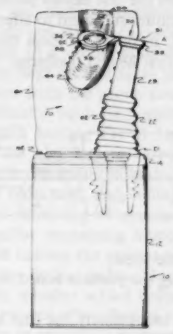
(e) sintering the molding in Na_2O alkaline atmosphere at a temperature of about 1500° to about 1750° C for about 5 to about 90 minutes.

4,082,827

PROCESS FOR BLOW MOLDING OF A SPOUT CONTAINER

Walter K. Chlystun, 327 St. James Dr., Spartanburg, S.C.

Filed Feb. 9, 1976, Ser. No. 656,644
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—98 **9 Claims**



1. An improved process for blow molding a container comprising the steps of:

(a) providing a pliant plastic parison between mold sections, said mold sections having blow mold cavities defined therein;

(b) bringing said mold sections into registry and entrapping said plastic parison therebetween, a portion of said parison being held within said cavities in said mold sections that define an article to be produced therein;

(c) simultaneously engaging another portion of said parison outside said mold cavities adjacent an end thereof with matching compression mold die portions of said mold sections which are angularly offset from a center line through said blow mold cavities, and forcing said another portion of said parison into said angularly offset die portions and entrapping same therebetween, thereby compression molding an appendage to said end of said container with a central opening defined therein, said appendage being positioned at an angle with respect to a plane tangent to an upper portion of said ends of said container; and

(d) thereafter injecting a blow fluid internally of said plastic parison portion whereby said plastic parison portion is forced outwardly into conformity with said blow mold cavities to produce the container therein.

4,082,828

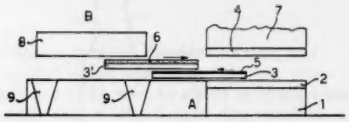
METHOD FOR PRODUCING THIN PARTICLE BOARD

Bruno Zulli, Via Mercatovecchio 19, 33100 Udine, Italy

Continuation of Ser. No. 477,341, Jun. 7, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,476
Claims priority, application Italy, Jun. 7, 1973, 83386 A/73; Jun. 7, 1973, 83387 A/73
Int. Cl.[2] B29J *5/00*
U.S. Cl. 264—119 **4 Claims**

1. A method for producing particle board, having a thickness of from 1–10 mm, from particulate material, consisting primarily of wood chips, and heat-curable resin, using a filling machine, a press having an upper pressing plate and a lower pressing plate, wherein at least the upper pressing plate is heatable to a temperature above that of the curing of the resin, and a first heatable platform which moves back and forth directly between the upper pressing plate and the lower pressing plate, comprising the steps of:

(1) filling the first heatable platform in the filling machine with the particulate material and the resin to form a mat of wood chips mixed with the resin, the first heatable platform, during said filling step, having already been heated to a temperature above ambient temperature and below the temperature of curing of the resin;
(2) shuttling the first heated platform with the mat directly to the press between the upper pressing plate and the lower pressing plate;
(3) pressing the mat between said plates without removing the mat from the first heated platform and heating the mat to a temperature sufficient to effect the curing of the resin of the mat, in order to form the particle board and to reheat the first heated platform;



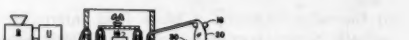
(4) opening the press;
(5) discharging the particle board from the heated platform; and
(6) returning immediately the first heated platform directly to the filling machine,
whereby during said steps (4) and (5) the first heated platform naturally reduces its temperature in a way that the reduced temperature is retained during said first and second steps above the ambient temperature but below the temperature of curing of the resin according to step (1) and the heated platform gives up the heat to the mat during said first and second steps.

4,082,829

PROCESS FOR MELT EXTRUDING COATING GRADE SARAN

Harri J. Brax; Joseph F. Porinchak, both of Spartanburg, and Alan S. Weinberg, Greenville, all of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 344,005, Mar. 22, 1973, Pat. No. 3,953,557, which is a division of Ser. No. 129,501, Mar. 30, 1971, Pat. No. 3,741,253. This application Jan. 2, 1976, Ser. No. 646,110
Int. Cl.² C08F *214/08*
U.S. Cl. 264—209 **3 Claims**



1. A method of forming a film from a copolymer of vinylidene chloride and vinyl chloride having a vinyl chloride content of 5–15 weight percent, said copolymer comprising from 5 to 100 weight percent of a liquid coating grade polymer having a lower melt viscosity than copolymers of vinylidene chloride and vinyl chloride normally used in melt extrusion processes, comprising the steps of:
introducing said copolymer into an extruder;
extruding said copolymer through an annular die to form a tubular film having a thickness of 1–5 mils; and
cooling said film to form a self-supporting film, the barrell on said extruder being maintained in the temperature range of 200°–320° F and the extrusion die being maintained in the temperature range of 280°–340° F.

4,082,830

PROCESS OF FORMING A PROTECTIVE COATING AND SHIPPING THE COATING FROM THE SURFACE BEING PROTECTED WHEN NO LONGER REQUIRED

Joseph A. Cogliano, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 251,880, May, 1972, Pat. No. 3,823,024. This application Apr. 23, 1974, Ser. No. 463,340
Int. Cl.² B29D *7/02*
U.S. Cl. 264—213 **2 Claims**

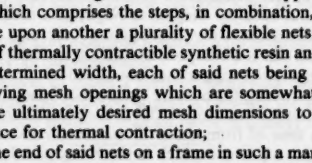
1. The process of stripping a coating on a substrate which comprises forming a coating by simultaneously impinging on said substrate two streams under ambient conditions, the first stream being a latex of a high polymer, said polymer particles in said latex being electrically charged and a second stream being a coagulant charged oppositely to that of the particles in said latex and after drying adding to the interface between said coating and said substrate an external debonding agent consisting essentially of a substantially non-volatile additive which is adhesive to at least one of either the substrate or coagulated coating, more soluble in water than in the coagulated latex polymer component and having a solubility parameter at least 2 (calories/cc.)$^{1/2}$ higher than the coagulated latex polymer component and thereafter stripping said coating from said substrate.

4,082,831

METHOD OF MAKING A MULTI-LEVEL FLOWER SUPPORTING NET ASSEMBLY

Chiaki Hase, Hazu, Japan, assignor to Daito Seimo Coshi Kaisha, Oaza-Ishiki, Japan

Filed May 23, 1977, Ser. No. 799,335
Int. Cl.² B29C *17/02*; B29D *9/00, 7/22*
U.S. Cl. 264—249 **4 Claims**



1. A method of making a multi-level flower supporting net assembly, which comprises the steps, in combination, of:
laying one upon another a plurality of flexible nets made of string of thermally contractible synthetic resin and having a predetermined width, each of said nets being elongate and having mesh openings which are somewhat greater than the ultimately desired mesh dimensions to provide allowance for thermal contraction;
placing one end of said nets on a frame in such a manner that the mesh openings of one net are correctly aligned with those of another, and extending said nets along the length of said frame;
folding said nets in a vertically zigzag pattern and holding them on said frame;
immersing said nets, together with said frame, for a predetermined length of time in a heating medium maintained at a predetermined temperature to allow said nets to undergo thermal contraction and be placed under tension across said frame to obtain said ultimately desired mesh dimensions;
removing said nets, together with said frame, from said medium and allowing said nets to cool down to ambient temperature; and

removing said nets from said frame, while maintaining said nets substantially in said zigzag pattern.

4,082,832

TREATMENT OF RAW MATERIALS CONTAINING TITANIUM

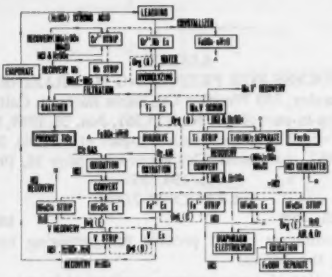
Morio Watanabe, Amagasaki, and Sanji Nishimura, Kyoto, both of Japan, assignors to Solex Research Corporation, Osaka, Japan

Filed Apr. 27, 1976, Ser. No. 680,928

Claims priority, application Japan, May 6, 1975, 50-55048; Jul. 21, 1975, 50-89433; Dec. 4, 1975, 50-144861; Jan. 16, 1976, 51-3939

Int. Cl.[2] C01G *23/04*

U.S. Cl. 423—70 7 Claims



1. In a method for obtaining titanium dioxide from titanium-containing raw materials wherein the materials are dissolved in sulfuric acid to form an aqueous solution of sulfuric acid containing dissolved titanium and other metals selected from the group consisting of iron, V, Mn, Cr, and Nb, and then forming a precipitate of $FeSO_4.nH_2O$ and the titanium in the solution is isolated and subsequently recovered as titanium dioxide from the aqueous solution, the improvement which comprises:

1. extracting Cr^{3+} and Nb^{5+} ions from the aqueous solution by contacting the aqueous solution with a first organic solvent selected from the group consisting of primary, secondary, tertiary and quaternary amines;
2. separating the aqueous solution resulting from step (1) and separating a major portion of the titanium ion in the solution by hydrolysis;
3. separating the aqueous solution resulting from the hydrolysis treatment of step (2) and extracting the titanium ions remaining in the aqueous solution with a second organic solvent selected from the group consisting of alkyl phosphoric acids mixed with from 2 to 5 percent higher alcohols and aromatic, aliphatic or paraffinic hydrocarbons as a diluent;
4. separating the aqueous solution resulting from the extraction of step (3), oxidizing the Fe^{+2} ions therein to Fe^{+3} ions and then extracting the Fe^{+3} ions with a third organic solvent selected from the group consisting of alkyl phosphoric acids in combination with from 2 to 5 percent higher alcohols and aromatic, aliphatic or paraffinic hydrocarbons as a diluent;
5. separating the aqueous solution resulting from step (4) and extracting the vanadium ions and other remaining heavy metal ions with a fourth organic solvent selected from the group consisting of primary, secondary, tertiary or quaternary amines in combination with from 2 to 5 percent higher alcohols and aromatic, aliphatic or paraffinic hydrocarbons as a diluent; and then
6. recovering, regenerating and concentrating the sulfuric acid remaining in the aqueous solution resulting from step (5).

4,082,833

CLAY HALOGENATION PROCESS

Ronald Wyndham, New Orleans, and John Christopher Terry, Metairie, both of La., assignors to Toth Aluminum Corporation, New Orleans, La.

Filed Jan. 6, 1976, Ser. No. 646,889

Int. Cl.[2] C01G *15/00*

U.S. Cl. 423—135 10 Claims

1. In a method of carbo-chlorinating clay to produce aluminum chloride and silicon chloride comprising the steps of: mixing and calcining clay and a solid carbonaceous reductant to form a reaction mass; and carbo-chlorinating the clay to produce aluminum chloride and silicon chloride by exposing the calcined reaction mass to a chlorinating agent; the improvement comprising the steps of: adding at least one sulfur containing member selected from the group consisting of elemental sulfur and functionally equivalent sulfur containing compounds to the clay and heating the at least one sulfur containing member and the clay before carbo-chlorination, with carbon being present in essentially stoichiometric proportion as the carbonaceous reductant; and adding at least one sulfur containing member consisting of elemental sulfur and functionally equivalent sulfur containing compounds to the calcined reaction mass and heating the at least one sulfur containing member and the clay during carbo-chlorination, the at least one sulfur containing member added before and during carbo-chlorination being present other than as a major reducing agent or reactant and in an amount to increase the yield and rate of formation of aluminum chloride and silicon chloride.

4,082,834

PROCESS FOR GETTERING MOISTURE AND REACTIVE GASES

Leonard N. Grossman, Livermore, and Douglas R. Packard, Sunol, both of Calif., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 343,268, Mar. 21, 1973, abandoned, which is a division of Ser. No. 74,471, Sep. 22, 1970, abandoned. This application Dec. 18, 1975, Ser. No. 642,124

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—210 7 Claims

1. A method of stoichiometrically removing moisture and gases selected from the group consisting of hydrogen, nitrogen, carbon monoxide, carbon dioxide and oxygen from an enclosed region at temperatures in the range of about 200° to about 650° C comprising the step of contacting the moisture and gases in the enclosed region with an alloy having the essential components of zirconium, nickel and titanium present in amounts of from about 3 to about 12 weight percent nickel, from about 3 to about 30 weight percent titanium and the balance being zirconium, so that said alloy stoichiometrically reacts and combines with said moisture and gases.

4,082,835

REMOVAL OF SO_2 FROM GASES

Frederick P. Chlanda, Rockaway; Krishnamurthy Nagasubramanian, Parsippany, and Kang-Jen Liu, Somerville, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jun. 27, 1975, Ser. No. 590,777

Int. Cl.[2] C01B *17/00;* B01K *5/00;* C01B *17/22, 17/48*

U.S. Cl. 423—242 25 Claims

1. A method for removing SO_2 from a gas which comprises:

(a) absorbing SO_2 from said gas by contact with a basic aqueous solution thereby forming an aqueous SO_2-containing salt solution in which soluble sulfites and bisulfites are present;

(b) dividing said solution into two streams A and B;

(c) subjecting said streams to electrodialytic water splitting in a two-compartment water splitter comprised of alternating cation and bipolar membranes wherein one of said streams is introduced into the water splitter compartments

between the cation membranes and the anion sides of the bipolar membranes;

(d) introducing the other stream, A, into the compartments of said splitter between the cation sides of the bipolar membranes and the cation membranes;

(e) passing a direct current through the water splitter thereby effecting the acidification of the stream A and the basicification of the stream B and the transfer of cations from stream A to stream B and producing an aqueous SO_2 containing solution derived from stream A and a solution comprised of base capable of absorbing SO_2 derived from stream B.

4,082,836

PROCESS FOR THE PURIFICATION OF PHOSPHORIC ACID BY EXTRACTION

Fernando Ore, Whittier, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 592,460, Jul. 2, 1975, abandoned. This application Apr. 13, 1976, Ser. No. 676,522

Int. Cl.[2] C01B *25/16*

U.S. Cl. 423—321 S **19 Claims**

1. A process for purifying an aqueous phosphoric acid phase which comprises the steps of:

a. contacting an unpurified aqueous phosphoric acid phase containing from 5% to about 55% P_2O_5 by weight and at least ionic metallic impurities comprising dissolved calcium, magnesium, iron (II) and (III) and aluminum compounds with an organic extractant phase containing a water immiscible organic sulfonic acid in its H^+ form in the volumetric ratio of organic extractant phase to aqueous phosphoric acid phase of about 1 to 1 to about 100 to 1 at a temperature of about 20° C to about 65° C to form:

i. an organic extractant phase containing the organic sulfonic acid, at least a portion of said ionic metallic impurities and extracted P_2O_5 values, and

ii. a purified aqueous phosphoric acid phase;

b. separating the purified aqueous phosphoric acid phase from the organic extractant phase;

c. contacting the organic extractant phase from (b) with a wash phase in the volumetric ratio of organic extractant phase to wash phase of from about 1 to 1 to about 100 to 1 at a temperature of from about 20° C to about 65° C, said wash phase consisting essentially of water or dilute phosphoric acid containing from about 10 grams/liter of P_2O_5, wherein said wash phase preferentially separates P_2O_5 from the ionic metallic impurities in said extractant phase, to form

i. a loaded wash phase enriched with the P_2O_5 values extracted from the organic extractant phase, and

ii. an organic phase containing the organic sulfonic acid, extracted metallic impurities and residual P_2O_5 values; and

d. separating the loaded wash phase from the organic extractant phase of step (c).

4,082,837

PROCESS FOR THE SELECTIVE CATALYTIC OXIDATION OF PARTIALLY OXIDIZED INORGANIC COMPOUNDS

James M. Whelan, La Canada, Calif., assignor to University of Southern California, Los Angeles, Calif.

Division of Ser. No. 556,670, Mar. 10, 1975, Pat. No. 3,976,599, which is a division of Ser. No. 194,769, Oct. 8, 1971, Pat. No. 3,885,020. This application Aug. 5, 1976, Ser. No. 712,002

Int. Cl.[2] C01B *21/24*

U.S. Cl. 423—405 **1 Claim**

1. A process for the selective oxidation of ammonia in the presence of elemental nitrogen with minimal oxidation thereof, which comprises combining the ammonia with a predetermined amount of oxygen containing gas to give at least a 1% stoichiometric excess of oxygen for the oxidation of the ammonia to nitric oxide; and passing the resulting mixture over a ceramic catalyst of the following empirical formula at an elevated temperature:

$$W_kX_nJ_{(1-k-n)}ZO_{(3\pm m)}$$

wherein

W is Zirconium, Tin or Thorium or mixtures thereof;

X is an alkaline earth metal or mixture thereof;

J is Scandium, Yttrium, a rare-earth element or mixture thereof;

Z is a metal of the first transition series or a mixture thereof, at least 0.01% of said metal having an oxidation state other than +3;

k is a number having a value between 0 and about 0.1;

m is a number having a value of from 0 to about 0.26; and

n is a number having a value from 0 to about 0.51, provided when n has a value of 0, k has a value between 0 and about 0.05.

4,082,838

PROCESS FOR PREPARING HYDRAZINE

John A. Pursley, 333 Woodley Ct., Santa Barbara, Calif. 93105

Continuation-in-part of Ser. No. 823,261, Jun. 26, 1959, Pat. No. 3,034,861, which is a continuation-in-part of Ser. No. 306,694, Aug. 27, 1952, abandoned. This application May 10, 1962, Ser. No. 194,755

Int. Cl.[2] C01B *21/16*

U.S. Cl. 423—408 **16 Claims**

1. A continuous cyclic process for preparing hydrazine comprising the step of:

(a) contacting in a non-aqueous medium at least one haloamine of the formula NH_2—X, where X is a halogen, with at least one material selected from the group consisting of the metals of Groups IA and IIA and the amides thereof to provide an anhydrous mixture containing hydrazine and a metal halide;

(b) separating said hydrazine from said anhydrous mixture;

(c) subjecting the hydrazine-poor residue of step (b) to direct current electrolysis to separate the metal component and the halogen component of said metal halide from each other; and

(d) recycling said metal for reaction with fresh haloamine in step (a).

4,082,839

PREPARATION OF SULFUR FLUORIDES

Richard Elmer Eibeck, Orchard Park, and Robert Edwin Booth, Hamburg, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 592,444, Jul. 2, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,142

Int. Cl.[2] C01D *3/02*; C01B *17/45, 7/22, 7/02*

U.S. Cl. 423—489 **18 Claims**

1. A process for preparing a sulfur fluoride component which is sulfur tetrafluoride, sulfur chloride pentafluoride or mixtures thereof comprising:

reacting under anhydrous conditions a sulfur chloride component selected from sulfur monochloride, sulfur dichloride, sulfur tetrachloride and mixtures thereof, with a fluorine containing component selected from nitrosyl fluoride, nitrosyl fluoride-hydrogen fluoride complexes and mixtures thereof, at a temperature above the highest melting point of any compound in the reaction mixture of sulfur chloride component and fluorine containing component;

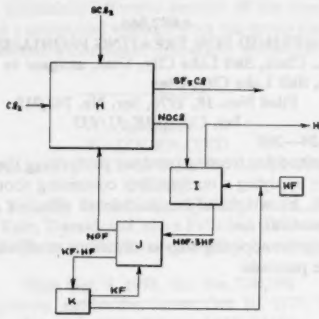
sulfur tetrafluoride being the predominant sulfur fluoride component when nitrosyl fluoride-hyrogen fluoride complex is the predominant fluorine containing component and sulfur chloride pentafluoride being the predominant sulfur fluoride component when nitrosyl fluoride is the predominant fluorine containing component and elemental chlorine is present;

thereby forming a mixture of said sulfur fluoride component and nitrosyl chloride; and

thereafter recovering from said mixture said sulfur fluoride component as the principal reaction product.

5. The process of claim 1 wherein nitrosyl fluoride is selected as the fluorine containing compound and excess Cl_2 is added to the reactant mixture to form sulfur chloride pentafluoride as the predominant sulfur fluoride.

6. The process of claim 5 wherein nitrosyl chloride is formed as a by-product and said nitrosyl chloride is reacted with hydrogen fluoride to form nitrosyl fluoride-hydrogen fluoride complex which complex is decomposed to regenerate nitrosyl fluoride which is recycled to the reactant mixture.



7. The process of claim 6 wherein nitrosyl fluoride-hydrogen fluoride complex is decomposed to regenerate nitrosyl fluoride by contacting said complex with potassium fluoride or sodium fluoride to form nitrosyl fluoride and potassium fluoride-hydrogen fluoride or sodium fluoride-hydrogen fluoride complex.

8. The process of claim 7 wherein the resulting potassium fluoride-hydrogen fluoride complex or sodium fluoride-hydrogen fluoride complex is heated to free hydrogen flouride which is recycled to form nitrosyl fluoride-hydrogen fluoride complex by reaction with nitrosyl chloride and to free the potassium fluoride or sodium fluoride for reuse in decomposing the nitrosyl fluoride-hydrogen fluoride complex.

4,082,840

BONE SEEKING TECHNETIUM 99M COMPLEX

Norman Adler, Arlington, and Leopoldo Lazaro Camin, Lexington, both of Mass., assignors to New England Nuclear Corporation, Ind.

Division of Ser. No. 410,086, Oct. 27, 1973, Pat. No. 4,016,249, which is a division of Ser. No. 288,577, Sep. 13, 1972, Pat. No. 3,851,044. This application Feb. 13, 1976, Ser. No. 657,923

Int. Cl.[2] A61K *43/00, 29/00*

U.S. Cl. 424—1 **29 Claims**

1. A composition for forming a complex with technetium-99m for radioactive scanning, comprising a stannous-phosphate complex, the phosphate moiety of which comprises pyrophosphate, said phosphate moiety containing no more than 25% of linear polyphosphates of formulation $P_nO_{3n+1}^{-(n+2)}$ having a polyphosphate moiety of molecular weight greater than pyrophosphate, the weight ratio of stannous to pyrophosphate moiety ranging from 10^{-3} to 0.50.

4,082,841

DENTIFRICE

Morton Pader, West Engelwood, N.J., assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 621,331, Oct. 10, 1975, abandoned, which is a continuation of Ser. No. 479,914, Jun. 17, 1974, abandoned, which is a continuation of Ser. No. 308,079, Nov. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 214,497, Dec. 30, 1971, abandoned, which is a continuation of Ser. No. 24,882, Apr. 1, 1970, abandoned. This application Oct. 29, 1976, Ser. No. 737,260

Int. Cl.[2] A61K *7/18, 7/28*

U.S. Cl. 424—50 **12 Claims**

1. A fluoride-free toothpaste composition capable of reducing dental plaque and calculus consisting essentially of by weight:

Dental Polishing Agent	1% - 70%
Humectant and water	30% - 80%
Foaming Agent	0% - 5%
Non-enzyme bound, pharmaceutically acceptable zinc salt of acetate, benzoate, borate, carbonate, citrate, dl-lactate trihydrate, phenolsulfonate, silicate, an alkanoate having 8 to 18 carbon atoms, salicylate, stannate, sulfate, tannate or titanate;	0.1% - 20%
Protease, carbohydrase or lipase enzyme preparation	0.1% - 20%

4,082,842

MEDICANT COMPOSITION FOR THE TREATMENT OF DIABETES

Armando Nahle, 828 Richard Dr., El Paso, Tex. 79907

Filed Feb. 21, 1975, Ser. No. 551,992

Int. Cl.[2] A61K *31/635, 31/375, 31/18*

U.S. Cl. 424—229 **5 Claims**

1. A composition effective for treating diabetes mellitus when administered in daily dosages of about 650 to 3900 milligrams, said composition comprising 65 to 85 weight percent of a hypoglycemic of the sulfonylurea type, 10 to 30 weight percent of sulfamethoxypyridazine, and 5 to 10 weight percent ascorbic acid.

4,082,843

3-(3-(3-SUBSTITUTED AMINO-2-HYDROXYPROPOXY)PHENYL)-6-HYDRAZINO PYRIDAZINES AND THEIR USE AS VASODILATORS AND β-ADRENERGIC BLOCKING AGENTS

William John Coates, Welwyn Garden City; Anthony Maitland Roe, Hatfield; Robert Antony Slater, Letchworth, and Edwin Michael Taylor, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

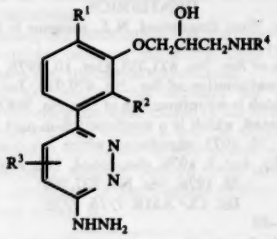
Continuation of Ser. No. 635,476, Nov. 26, 1975, abandoned. This application Dec. 15, 1975, Ser. No. 640,666

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.[2] C07D *237/20;* **A61K** *31/50*

U.S. Cl. 424—250 **12 Claims**

1. A compound of the formula



wherein D R^1 or R^2 is hydrogen, the other group being hydrogen, methyl, fluoro, chloro, bromo, hydroxy, methoxy, hydroxymethyl, cyano, nitro or amino;

R^3 is hydrogen or methyl; and

R^4 is isopropyl, tertiary butyl or phenylethyl; or a pharmaceutically acceptable salt thereof.

12. A method of concomitantly inhibiting β-adrenergic receptors and producing vasodilatation which comprises administering a compound of claim 1 internally to an animal in need thereof in an amount sufficient to block said receptors and produce vasodilatation.

4,082,844

6-CHLORO-2-(1-PIPERAZINYL)PYRAZINE

William C. Lumma, Jr., Pennsburg, and Walfred S. Saari, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 656,664, Feb. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 570,052, Apr. 21, 1975, abandoned. This application Jun. 15, 1976, Ser. No. 696,255

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.[2] A61K *31/495*; C07D *241/10*

U.S. Cl. 424—250 **3 Claims**

1. 6-Chloro-2-(1'-piperazinyl)pyrazine, or N-oxide or a pharmaceutically acceptable salt thereof.

3. A method of producing an anorexic effect which comprises administering to a patient in need of such treatment an effective amount of 6-chloro-2-(1'-piperazinyl)pyrazine or N-oxide, or a pharmaceutically acceptable salt thereof.

4,082,845

3-(1-PIPERAZINYL)-PYRIDO[2,3-b]PYRAZINES

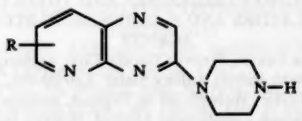
Walfred S. Saari, Lansdale, and William C. Lumma, Jr., Pennsburg, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 25, 1977, Ser. No. 790,362

Int. Cl.[2] A61K *31/495*; C07D *295/12*

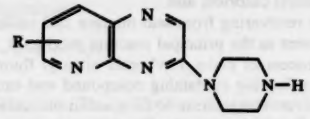
U.S. Cl. 424—250 **5 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen, halo, trifluoromethyl, lower alkyl having from 1 to 3 carbon atoms, lower alkylthio having from 1 to 3 carbon atoms, lower alkoxy having from 1 to 3 carbon atoms or cyano.

5. A pharmaceutical anorectic composition comprising a pharmaceutical carrier and an effective amount of a compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen, halo, trifluoromethyl, lower alkyl having from 1 to 3 carbon atoms, lower alkylthio having from 1 to 3 carbon atoms, lower alkoxy having from 1 to 3 carbon atoms or cyano.

4,082,846

METHOD FOR TREATING PSORIASIS

Lealand L. Clark, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Nov. 18, 1976, Ser. No. 743,015

Int. Cl.[2] A61K *31/455*

U.S. Cl. 424—266 **3 Claims**

1. A method for treating psoriasis comprising the steps of:

topically applying a composition containing about 0.5% to 10.0%, by weight of isoniazid in an effective amount to the psoriasis; and

repeating the applying step as necessary to effect treatment of the psoriasis.

4,082,847

SUBSTITUTED AMINOETHANOLS AND PHARMACEUTICAL USE

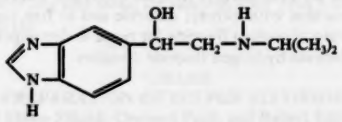
Carroll D. Arnett, Durham, N.C.; Jeremy Wright, Baltimore, and Nicolas Zenker, Lutherville, both of Md., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 6, 1976, Ser. No. 747,661

Int. Cl.[2] A61K *31/415*; C07D *235/08*

U.S. Cl. 424—273 R **11 Claims**

1. An R- or S- isomer having the formula



or mixtures of said isomers or pharmaceutically acceptable salts thereof.

9. A pharmaceutical composition for reducing ocular hypertension or for effecting bronchodilatation comprising an effective amount of compound of claim 1 in a suitable dosage form.

4,082,848

2-HIGHER ALKYL-3-HYDROXY-1,4-NAPHTHOQUINONE CARBOXYLIC ACID ESTERS

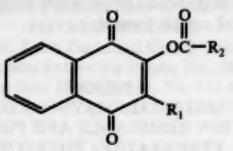
Russell Frank Bellina, Wilmington, and Dennis Lynn Fost, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 613,553, Sep. 15, 1975, Pat. No. 4,055,661, which is a continuation-in-part of Ser. No. 531,483, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 494,294, Aug. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,692, May 10, 1974, abandoned. This application Apr. 29, 1976, Ser. No. 681,594

Int. Cl.[2] A01N *9/20, 9/22, 9/24*; C07C *49/68*

U.S. Cl. 424—273R **11 Claims**

1. Compound of the formula:



wherein,

R_1 is alkyl of 12 to 14 carbon atoms which are straight chain, and

R_2 is methyl or ethyl.

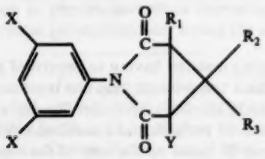
9. A composition for the control of mites consisting essentially of a miticidally effective amount of the compound of claim 1 and a compound selected from the group consisting of chlorodimeform, formetanate, propargite, tetradifon and benomyl.

4,082,849
HALOGENATED N-(3,5-DIHALOPHENYL)CYCLOPROPANEDICARBOXIMIDES

Nobuyuki Kameda, Takarazuka; Yoshio Hisada, Kawanishi; Toshiro Kato, Ibaraki, and Akira Fujinami, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Oct. 8, 1976, Ser. No. 730,984
Claims priority, application Japan, Oct. 15, 1975, 50-124670
Int. Cl.[2] C07D *209/52;* A61K *31/40*
U.S. Cl. 424—274 8 Claims

1. A compound of the formula:



wherein X and Y are each a chlorine atom or a bromine atom and R_1, R_2 and R_3 are individually a hydrogen atom or a methyl group.

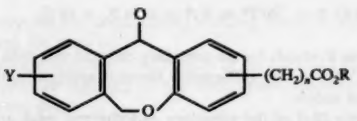
6. A method for controlling fungi which comprises applying a fungicidally effective amount of the compound according to claim 1 to the fungi.

4,082,850
METHOD OF TREATING DERMAL INFLAMMATIONS

Howard B. Lassman, Flemington, and William J. Novick, Jr., Lebanon, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Apr. 16, 1976, Ser. No. 677,544
Int. Cl.[2] A61K *31/335*
U.S. Cl. 424—278 23 Claims

1. A method of treating dermal inflammation which comprises topically administering to the inflamed area of a patient an effective amount of a compound of the formula



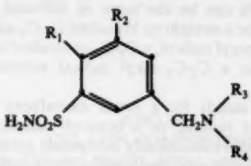
wherein Y is hydrogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, halogen or trifluoromethyl; R is hydrogen or straight or branched chain alkyl of from 1 to 6 carbon atoms; and *n* is an integer of from 1 to 7, or a physiologically tolerable salt thereof.

4,082,851
SULPHONAMIDES, COMPOSITIONS CONTAINING THE SAME AND METHODS FOR USING THE SAME IN THE TREATMENT OF HYPERTENSION OR ODEMEAS

Peter Werner Feit, Gentofte; Ole Bent Tvaermose Nielsen, Vanlose; Herta Bruun, Malov, and Claus Aage Svensgaard Bretting, Copenhagen, all of Denmark, assignors to Leo Pharmaceutical Products Ltd., Ballerup, Denmark

Filed Jun. 16, 1976, Ser. No. 696,547
Claims priority, application United Kingdom, Jul. 8, 1975, 28770/75; Jul. 8, 1975, 28775/75; Jul. 8, 1975, 28774/75; Jul. 8, 1975, 28773/75; Jul. 8, 1975, 28772/75
Int. Cl.[2] A61K *31/18, 31/135;* C07C *143/80, 143/78*
U.S. Cl. 424—300 28 Claims

1. A compound of the formula I



(I)

in which

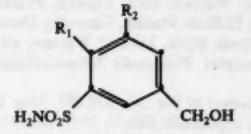
R_1 stands for an unsubstituted or substituted phenoxy or phenylthio radical;

R_2 stands for a $—YR_2'$ radical, in which Y represents —O—, —S—, or —NH—, and R_2', which may be unsubstituted or substituted, represents C_1-C_6-alkyl, C_2-C_6-alkenyl or -alkynyl; or methyl or ethyl substituted with phenyl radical;

R_3 and R_4 which can be the same or different, and unsubstituted or substituted, stand for hydrogen or for a straight or branched C_1-C_8-alkyl, C_2-C_8-alkenyl or -alkynyl radical, a C_3-C_7-cycloalkyl or a phenyl radical, or for a C_1-C_3 alkyl radical substituted with phenyl; and

R_4 furthermore stands for a lower carbalkoxy radical, a C_1-C_6 alkanoyl radical, or a benzoyl radical; and salts thereof with pharmaceutically acceptable acids wherein when substituted the substituents of R_1, R_2', R_3, and R_4 are selected from the group consisting of halogen atoms, lower alkyl, halo-lower alkyl, nitro and amino groups, mono- or dialkylamino or acylamino groups, hydroxy groups, hydroxy groups, lower alkoxy groups or hydroxy groups esterified with lower aliphatic carboxylic acids, and lower alkylthio or phenylthio radicals.

18. A compound of formula III



(III)

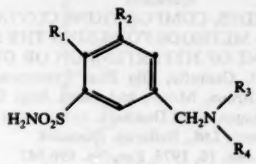
in which R_1 stands for an unsubstituted or substituted phenoxy or phenylthio radical;

R_2 stands for a $—YR_2'$ radical, in which Y represents —NH—, and R_2', which may be unsubstituted or substituted, represents C_1-C_6-alkyl, C_2-C_6-alkenyl or -alkynyl; or methyl or ethyl substituted with a phenyl radical;

wherein when substituted the substituents of R_1 and R_2' are selected from the group consisting of halogen atoms, lower alkyl, halo-lower alkyl, nitro and amino groups, mono- or dialkylamino or acylamino groups, hydroxy groups, lower alkoxy groups or hydroxy groups esterified

with lower aliphatic carboxylic acids, and lower alkylthio or phenylthio radicals.

19. A compound of the formula I



(I)

in which

R_1 stands for a phenoxy, phenylthio or benzyl radical;

R_2 stands for a $—YR_2'$ radical, in which Y represents —O—, —S—, or —NH—, and R_2', represents C_1-C_6-alkyl, C_2-C_6-alkenyl or -alkynyl; or methyl or ethyl substituted with phenyl radical;

R_3 and R_4 which can be the same or different, stand for hydrogen or for a straight or branched C_1-C_8-alkyl, C_2-C_8-alkenyl or -alkynyl radical, a C_5-C_7-cycloalkyl or a phenyl radical, or for a C_1-C_3 alkyl radical substituted with phenyl; and

R_4 furthermore stands for a lower carbalkoxy radical, a C_1-C_6 alkanoyl radical, or a benzoyl radical; and salts thereof with pharmaceutically acceptable acids.

28. A method of treating patients suffering from oedematous conditions and from hypertension, comprising administering to adult patients from 0.25 to 100 mg per day of a compound of formula I of claim 1 or an equivalent amount of a salt thereof as defined in claim 1.

4,082,852

COMPOSITION FOR SANITIZING OF SURFACES

Florian Heiss, Heidstucken 27, 2000 Hamburg 71, Germany

Filed Aug. 24, 1973, Ser. No. 390,377

Claims priority, application Switzerland, Aug. 22, 1972, 12441/72; Germany, May 16, 1973, 2324587

Int. Cl.² A01N *9/24;* A61L *9/04*

U.S. Cl. 424—317 **21 Claims**

1. A composition suitable for sanitizing the surface of a material which comes into contact with the human body comprising

(A) a substantially water insoluble bacteriostatic halogen substituted phenol,

(B) a bactericide which comprises a water soluble aldehyde,

(C) an unsubstituted aliphatic alcohol with 1 to 5 carbon atoms in the molecule and

(D) water.

4,082,853

METHOD FOR COAGULATING MILK PROTEINS

Maria Szadkowska, Warsaw; Jerzy Pisarek, Pruszkow; Boleslaw Dzik, Ilawa; Elzbieta Staniak, Garwolin; Danuta Lipniewska, and Franciszek Bijok, both of Warsaw, all of Poland, assignors to Instytut Przemyslu Mleczarskiego, Warsaw, Poland

Continuation-in-part of Ser. No. 578,897, May 19, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,560

Int. Cl.² A23C *19/02*

U.S. Cl. 426—36 **8 Claims**

1. A method for coagulating milk proteins to produce curd comprising adding calcium, a quantity of proteolytic-coagulating enzyme in insufficient quantity to cause milk coagulation to milk plus a starter culture to milk at an acidity of °SH 6.0 to 8.5 at a first temperature ranging from about 0° C. to about 32° C., maintaining the milk at said first temperature for from 1 to 24 hours, then raising the temperature of the milk to a second, higher, temperature ranging from about 20° C. to about 45° C., and adding another proteolytic-coagulating enzyme to the milk at said second temperature range and at a second, higher, acidity of from about 7.0 °SH to about 12.5 °SH, and maintaining the milk at said second temperature range for about 5 to 120 minutes until curd is formed.

4,082,854

PACKAGING MATERIALS HAVING EXCELLENT GAS PERMEATION RESISTANCE AND PROCESS FOR PREPARATION THEREOF

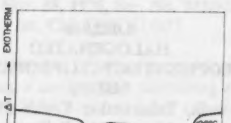
Muneki Yamada, Ebina; Sadao Hirata, Yokohama; Akira Kishimoto, Yokohama; Shunsaku Hirata, Yokohama; Toru Suzuki, Yokosuka, and Fumio Kano, Kamakurashidai, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Feb. 23, 1976, Ser. No. 660,003

Claims priority, application United Kingdom, Mar. 3, 1975, 8809/75

Int. Cl.² B65D *85/00;* C08G *41/04;* B32B *27/08*

U.S. Cl. 426—106 **14 Claims**



1. A packaging material having an improved gas permeation resistance, which comprises at least one layer composed of (A) an ethylene-vinyl alcohol copolymer having a vinyl alcohol content of 50 to 75 mole % and a residual vinyl ester content of up to 4 mole % based on the sum of the vinyl alcohol and vinyl ester or (B) a blend of said ethylene-vinyl alcohol copolymer with 25 to 150% by weight, based on said copolymer, of at least one thermoplastic polymer selected from the group consisting of polyolefins and carbonyl group-containing polymers, said ethylene-vinyl alcohol copolymer having a main endothermic peak satisfying substantially the following requirement:

$$Y^1 = 1/64\ X + 68.0$$

wherein Y_1 stands for the main endothermic peak temperature (° C.) in the differential thermal analysis, and X stands for the vinyl alcohol content (mole %) in the ethylene-vinyl alcohol copolymer.

and at least one subsidary endothermic peak satisfying substantially the following requirement:

$$0.67\ X + 76/7^2 = Y_2^2 = 0.40\ X + 40.0$$

preferably

$$0.67\ X + 76/7^2 = Y_2^2 = 0.34\ X + 88.0$$

wherein Y_2 stands for the subsidary endothermic peak temperature (° C.) in the differential thermal analysis, and X is as defined above.

the ratio (Rs) of the subsidary endothermic peak area to the main endothermic peak area being at least 2.5%.

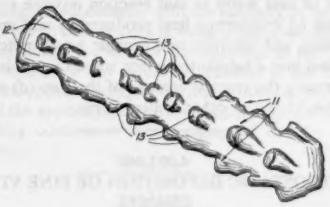
14. A packaging material as set forth in claim 1 wherein said carbonyl group-containing polymer has a carbonyl group at a concentration of 120 to 1400 meq/100 g of the polymer.

4,082,855

PROCESS FOR PRODUCING A FRENCH FRIED POTATO PRODUCT

James E. Citti, St. Louis Park, and Carl S. Dienst, Edina, both of Minn., assignors to Ore-Ida Foods, Inc., Boise, Id.

Filed Jun. 15, 1973, Ser. No. 370,430
Int. Cl.[2] A23L *1/27, 1/10;* A23B *4/04*
U.S. Cl. 426—250 6 Claims



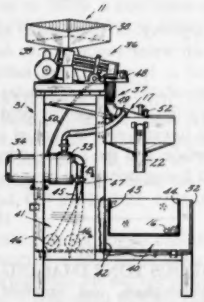
1. A process for producing an elongate potato product simulating a French fry but having superior crispness, comprising preparing an extrudable potato dough containing mashed blanched potatoes and an emulsifier and having a moisture content within the range of about 60% to about 75% by weight; extruding said dough in hot condition within a temperature range of about 100° F. to about 175° F. through a die having a cavity in approximately the form of a Maltese cross wherein the arms of the cross diverge in their extension outwardly and their outer ends have acute angle corners, so as to produce an elongate extrusion having a plurality of longitudinal ridges alternating with longitudinal valleys, said ridges breaking transversely of their lengths at frequent intervals during extrusion to provide serrations therealong as a multiplicity of individual projections; and frying the extrusion.

4,082,856

PROCESS AND APPARATUS FOR SHELLING EGGS

Theodore Carl Zwiep; Donn G. Newhouse, both of Grand Rapids, and Jerry D. Craner, Jenison, all of Mich., assignors to Country Queen Foods, Inc., Grand Rapids, Mich.

Filed Feb. 26, 1976, Ser. No. 661,737
Int. Cl.[2] A23L *1/32;* A23N *5/00*
U.S. Cl. 426—299 13 Claims



4. A process for continuously shelling hard cooked eggs comprising the steps of:

presenting a continuous succession of hard cooked eggs to a progressive cracking of the shell under vibration in an inclined plane;

flagellating said eggs in successive continuity through a resilient annulus while subjecting said eggs to a jet stream of fluid;

gravity conveying said eggs onto a final wash station;

subjecting said eggs to a final spray wash, said spray moving said eggs through a prearranged path;

separating said shells from said eggs; and

recycling fluid for reuse.

4,082,857

GELATIN COMPOSITION

Ronald John Croome, Cardiff, Wales, assignor to P. Leiner & Sons Limited, Treforest, Wales

Filed Oct. 18, 1976, Ser. No. 733,033
Claims priority, application United Kingdom, Oct. 21, 1975, 43212/75
Int. Cl.[2] A23L *1/06, 1/04*
U.S. Cl. 426—573 15 Claims

1. An acidic dessert gel in which the gel-forming ingredients consist essentially of a polysaccharide gelling agent and a chemically modified gelatin gelling agent, the isoelectric point of said chemically modified gelatin gelling agent being below the pH of the gel.

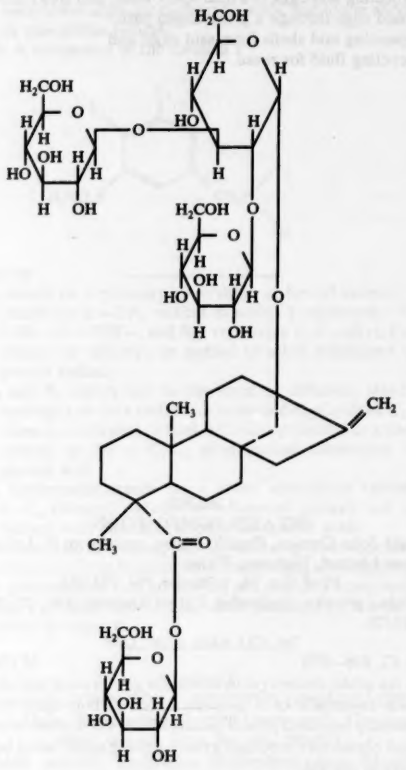
4,082,858

SWEETENING COMPOUND, METHOD OF RECOVERY, AND USE THEREOF

Toyoshige Morita, Takatsuki; Isamu Fujita, Kashihara, and Junichi Iwamura, Yao, all of Japan, assignors to F. K. Suzuki International, Inc., Arlington Heights, Ill.

Filed Jun. 2, 1976, Ser. No. 692,218
Claims priority, application Japan, Jun. 4, 1975, 50-067335
Int. Cl.[2] A23C *3/00;* C07H *15/00*
U.S. Cl. 426—597 6 Claims

1. A substantially pure sweetening compound in the form of colorless crystals, said compound having the structural formula:



2. A sweetened product for oral ingestion which comprises a foodstuff and an effective amount of the sweetening compound of claim 1 admixed therewith.

4,082,859

CONVERSION OF CELLULOSE AND LIGNIN ORGANIC WASTE MATERIAL INTO A MORE DIGESTIBLE AND MANAGEABLE FORM

Sol Katzen, Hanasi St. No. 62, Herzilya Pituach, Israel

Filed Jul. 1, 1975, Ser. No. 592,227
Int. Cl.[2] A23K *1/12*
U.S. Cl. 426—636 **12 Claims**

1. A process for the conversion of cellulose and lignin organic waste material into a more digestible and manageable form which consists of the steps:

(a) reducing said cellulose or lignin organic waste material to a size less than 2 inches to facilitate further handling, when said organic waste material has a size greater than 2 inches, said cellulose or lignin organic waste material being selected from the group consisting of straw, stover, wood shavings, bagesse, corn cobs, peanut hulls, peat, tobacco stems, cocoa shells, rice hulls and soybean hulls;

(b) admixing an acid selected from the group consisting of phosphoric acid, hydrochloric acid, sulfuric acid, and mixtures thereof with about 40 to 60 percent by weight of said organic waste material;

(c) admixing, before, after or simultaneously with step (b), a base selected from the group consisting of calcium hydroxide, sodium hydroxide, potassium hydroxide, ammonium hydroxide and mixtures thereof with the remainder of said organic waste material; (d) mixing and reacting said acidified organic waste material with said basified organic waste material, a more digestible form of said organic waste material resulting, about 80 to 120 parts by weight of said acidified organic waste material being used per 100 parts by weight of said basified organic waste material, said reaction mixture contains about 20 to 60 percent by weight of water based on the total weight of said reaction mixture, said water level being achieved whenever said water level is not present by drying said starting cellulose or lignin organic waste material or adding water to said cellulose or lignin organic waste material or portion thereof used in step (b) or step (c), whereupon part of said water in said reaction mixture converted to steam by exothermic heat produced as said reaction progresses, and whereby said organic waste material is converted into a substantially dry, more digestible form; and

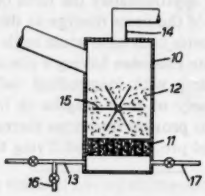
(e) forming the reacted mixture of the step (d) into pellets, cubes, blocks or other similar forms.

4,082,860

ELECTROSTATIC DEPOSITION OF FINE VITREOUS ENAMEL

Roger Patrick Corbett, Bassett; Trevor Robert Gilson, Hythe; Terence Patrick Nealon, Cardiff, and Patrick John Hendra, Crawley, near Winchester, all of England, assignors to Edward Curran Engineering Limited, Cardiff, England

Filed Mar. 14, 1975, Ser. No. 558,453
Int. Cl.[2] B05B *5/02*
U.S. Cl. 427—27 **4 Claims**



1. A method of applying a coating of a vitreous enamel to a conducting base surface, using a powder comprising small particles of an alkali-boro silicate vitreous enamel frit, between 5μ and 200μ in size, which have been surface treated by exposure to a chloro-silane compound of the formula

$$R_n - SiCl_{4-n}$$

where R is an aklyl, phenyl or vinyl group and n is 1,2, or 3, and also reacted with water vapor to give increased particle surface resistivity of at least 10^{12} ohm meters, the method comprising the stages of charging the particles electrostatically and subjecting the particles to an electric field causing the said particles to migrate towards and adhere as a coating to said conducting base surface, and the said powder coating is subjected to a thermal fusing operation causing said powder to vitrefy.

4,082,861

CONTINUOUS TONE IMAGING FILM

Masatsuga Izu, Birmingham, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Sep. 23, 1976, Ser. No. 725,926
Int. Cl.[2] B95C *5/00*; G03C *5/16, 5/04*
U.S. Cl. 427—56 **41 Claims**

1. A continuous tone dry process imaging film comprising a substrate, a solid, high optical density and substantially opaque film of a dispersion imaging material deposited on said substrate, said substantially opaque film of the dispersion imaging material, upon application of energy in an amount sufficient to increase the absorbed energy in the material above a certain

critical value, being capable of changing to a substantially fluid state in which the surface tension of the material acts to cause the substantially opaque film where subject to said energy to disperse and change to a discontinuous film comprising openings and deformed material which are frozen in place following said application of energy and through which openings light can pass, and means associated with said film of imaging material for retarding the change to the discontinuous film, caused by the surface tension, and for controlling the amount of such change in accordance with the intensity of the applied energy above said certain critical value to increase the amount of said change and the area of the openings in the film and decrease the area of the deformed material in the film and, therefore, the optical density of the film in accordance with the intensity of the applied energy above said certain critical value for providing continuous tone imaging of the dry process imaging film.

4,082,862

PROCESS FOR THE PRODUCTION OF RUBBER ARTICLES HAVING IMPROVED SLIP COATING

Pascal E. Esemplare, Mountainside, N.J., and Dennis Beeferman, Brooklyn, N.Y., assignors to Sutures Inc., Coventry, Conn.

Division of Ser. No. 589,677, Jun. 24, 1975, Pat. No. 4,027,060, which is a continuation-in-part of Ser. No. 405,863, Oct. 12, 1973, Pat. No. 3,919,442. This application Oct. 18, 1976, Ser. No. 733,399

The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.

Int. Cl.² B32B *25/08*

U.S. Cl. 427—133 **7 Claims**

1. In a process for the production of rubber articles having a slip coating on at least one surface thereof, wherein a form is first coated with a release agent, a slip coating composition is provided on said release agent coated form and a rubber substrate is thereafter formed over said slip coating, the improvement which comprises eliminating the need for said coating of release agents by selecting as said slip coating composition a mixture of polymeric resins consisting essentially of about 5 to 95% by weight of a film-forming, non-elastomeric synthetic polymer component (1) having an elongation of at least about 200% and about 95 to 5% by weight of a normally solid, non-elastomeric, synthetic polymer component (2) exhibiting an elongation of below about 20% and a coefficient of friction of up to about 0.20, said slip coating having an elongation of at least about 200 up to 700%, a coefficient of friction of up to about 0.25 and a thickness of below about 0.005 inch.

4,082,863

FABRICATION OF CERAMIC HEAT PIPES

Edna A. Dancy, Beaconsfield, and James H. Vansant, Chambly, both of Canada, assignors to Hydro-Quebec, Canada

Filed Sep. 29, 1976, Ser. No. 727,707

Claims priority, application Canada, Sep. 28, 1976, 262251

Int. Cl.² B05D *7/22, 1/36, 3/02*

U.S. Cl. 427—181 **24 Claims**

1. A method of forming a porous capillary layer of a metal oxide ceramic material onto a metal oxide ceramic substrate, which comprises covering the surface of the substrate with an aqueous slurry of a powdered mixture comprising the metal oxide of the ceramic substrate, silica and an alkali metal or alkaline-earth metal oxide, said powdered mixture having a maximum particle size of about 44 microns, removing excess slurry, depositing onto the wet surface a layer of granular ceramic material having a particle size of about 250 to about 500 microns, said granular ceramic material being applied in excess relative to the powder of the aqueous slurry to insure that a porous capillary structure will be obtained and causing the slurry to be drawn up between the particles so as to absorb substantially all the slurry, and firing the coated surface at a temperature to effect bonding of the ceramic layer, the powdered constituents of said mixture being proportioned to provide liquid phases at about 200°–300° C above the firing temperature.

4,082,864

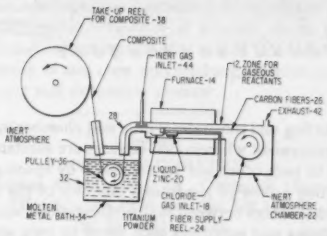
REINFORCED METAL MATRIX COMPOSITE

Ernest G. Kendall, El Segundo, Calif., and Roger T. Pepper, Cape Elizabeth, Me., assignors to Fiber Materials, Inc., Biddeford, Me.

Filed Jun. 17, 1974, Ser. No. 480,090

Int. Cl.² C09K *1/66;* C23C *1/08;* B44D *1/16*

U.S. Cl. 427—248 B **17 Claims**



1. The process of improving the wettability of multifilament carbon fibers by molten metal by coating the fibers with titanium boride comprising:

admixing in a reaction zone a gaseous atmosphere of a chloride of titanium, boron chloride and zinc vapor;

heating the reaction zone;

and subjecting the carbon fibers to the atmosphere within the reaction zone whereby a titanium boride is formed on the surfaces of the multifilament fibers.

7. Method of forming a fiber-metal composite, comprising the steps of:

forming a coating of titanium boride on a plurality of carbon fibers;

immersing the coated fibers into a body of molten metal selected from the group consisting of magnesium, lead, zinc, copper, aluminum, tin and alloys of said metals until said metal substantially fills the interstices between said fibers; and

cooling the metal body with said coated fibers embedded therein to a temperature at which said metal solidifies.

17. The method of forming a fiber-metal composite comprising the steps:

subjecting a plurality of carbon fibers to an atmosphere including a gaseous compound of titanium, a gaseous compound of boron, and zinc vapor, said atmosphere being at an elevated temperature at which the both said compounds are normally reduced by the zinc vapor, said fibers being subjected to said atmosphere for a time sufficient to render them wettable by a molten metal; thereafter,

immersing the carbon fibers in a body of molten metal selected from the group consisting of magnesium, lead, zinc, copper, aluminum, tin, and alloys of said metals, until said metal substantially fills the interstices among said fibers; and

cooling the metal filled fibers to a temperature at which said metal solidifies.

4,082,865

METHOD FOR CHEMICAL VAPOR DEPOSITION

Vladimir Sinisa Ban, Hopewell, N.J., and Stephen Lee Gilbert, Concord, Vt., assignors to RCA Corporation, New York, N.Y.

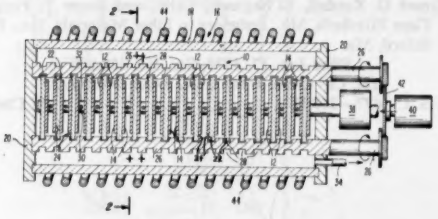
Continuation-in-part of Ser. No. 743,317, Nov. 19, 1976. This application Mar. 21, 1977, Ser. No. 779,679

Int. Cl.² B05D *5/12*

U.S. Cl. 427—253 **7 Claims**

1. In a method of chemically vapor-depositing a material

onto the surfaces of a plurality of substrates within a reaction chamber wherein said substrates are heated while contacting said surfaces with a gaseous compound of said material to be deposited, the improvement in said method comprising the steps of:



supporting said substrates within said chamber in a stack-like arrangement wherein said surfaces are substantially parallel to each other and are separated by spacings, and

directing a flow of gas from a plurality of gas nozzles into said spacings between said surfaces while simultaneously rotating said substrates each about its own axis.

4,082,866

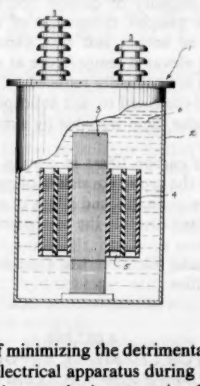
METHOD OF USE AND ELECTRICAL EQUIPMENT UTILIZING INSULATING OIL CONSISTING OF A SATURATED HYDROCARBON OIL

Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Continuation-in-part of Ser. No. 599,372, Jul. 28, 1975, which is a continuation of Ser. No. 433,053, Jan. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 292,670, Sep. 27, 1972, abandoned. This application Sep. 25, 1975, Ser. No. 616,673

Int. Cl.² H01B *3/22;* C10G *23/00*

U.S. Cl. 427—294 **9 Claims**



1. The method of minimizing the detrimental effects that can result in oil filled electrical apparatus during high fault conditions which comprises employing as an insulating oil in such electrical apparatus a relatively nonflammable and biodegradable oil consisting essentially of a saturated hydrocarbon oil having an average molecular weight of about 500 to about 700 and a fire point above 200° C, which oil is liquid throughout the temperature range of 0° to 40° C.

4,082,867

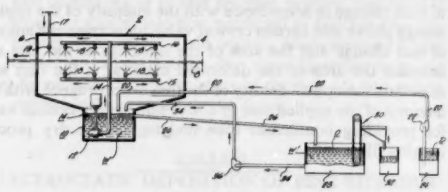
OIL EMULSION REMOVAL AND RECOVERY OF OIL

Thomas D. Henley, Broomall, and Richard F. Reeves, Roslyn, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 483,754, Jun. 27, 1974, abandoned. This application Aug. 12, 1976, Ser. No. 713,806

Int. Cl.² C23G *5/00*

U.S. Cl. 427—327 **20 Claims**



1. A continuous process in which a plurality of moving articles with metallic surfaces having an oil emulsion thereon are first cleaned and then coated comprising:

(A) removing said oil emulsion from said surfaces by contacting them with an aqueous solution consisting essentially of wash water and an oil insoluble demulsifier under conditions which form a turbulent mixture of said wash water, demulsifier and oil emulsion;

(B) collecting said turbulent mixture containing said demulsifier which is effective in breaking said oil emulsion to liberate oil therefrom;

(C) allowing said oil to separate thereby forming a distinct upper oil phase and a distinct lower wash water and demulsifier phase and removing said oil of said upper phase from said wash water and demulsifier of said lower phase in a quiescent stage, whereby oil is recovered;

(D) recycling said wash water and demulsifier having said oil removed therefrom by contacting other of said articles with said wash water and demulsifier; and thereafter

(E) applying to said metallic surfaces coating solution which forms thereon coatings to which siccative finishes adhere.

4,082,868

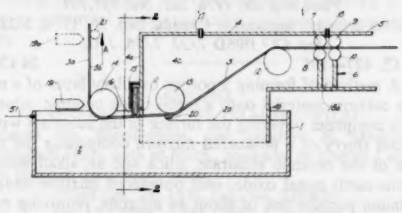
METHOD FOR CONTINUOUSLY CONTACT-COATING ONE SIDE ONLY OF A FERROUS BASE METAL STRIP WITH A MOLTEN COATING METAL

Paul E. Schnedler, Middletown; Marvin B. Pierson, Franklin; Hart F. Graff, Middletown; Thomas A. Compton, Middletown, and William R. Leasure, Middletown, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Mar. 18, 1976, Ser. No. 668,241

Int. Cl.² C23C *1/08, 1/06, 1/02*

U.S. Cl. 427—329 **24 Claims**



1. A process of producing a ferrous base metal strip coated with a coating metal on one side only, the other side of said strip remaining free of said coating metal, said ferrous base metal strip having been treated to bring it to a coating temperature sufficiently high to prevent casting of said coating metal thereon and low enough to prevent excess coating metal - base metal alloying and to render its surfaces clean and free of oxide, said process comprising the steps of providing means for

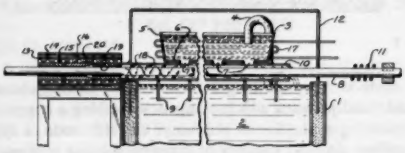
containing a molten bath of said coating metal having an upper surface formed by said containing means, conducting said strip to a position above said upper surface of said bath such that the surface tension and wetting characteristics of said molten coating metal will permit the formation of a meniscus at said upper surface of said bath contacting that side of said strip facing said bath, forming said meniscus, maintaining said meniscus and continuously contact coating said one side only of said strip therewith, maintaining said oxide-free strip in a protective, non-oxidizing atmosphere at least until said one side of said strip has been initially contacted by said meniscus and finishing said coated side of said strip by removing excess coating metal therefrom.

4,082,869

SEMI-HOT METALLIC EXTRUSION-COATING METHOD

Anthony J. Raymond, 20429 Attica Rd., Olympia Fields, Ill. 60461

Filed Jul. 8, 1976, Ser. No. 703,532
Int. Cl.² B05D *1/00;* **B05C** *3/04*
U.S. Cl. 427—357 **9 Claims**



1. A method of providing a uniform metallic coating on a moving work piece, comprising the steps of:
- moving a said workpiece in a fixed path, including passage through a splash tube;
- surrounding the work piece with molten metal during said movement;
- containing the molten metal in close proximity to the work piece throughout its coating movement within the splash tube;
- agitating progressively the contained molten metal with a series of spiral ribs positioned toward the exit end of the splash tube;
- cooling the molten metal to approach a plastic state as it moves in the direction of work piece movement past the splash tube; and
- uniformly confining the thickness of the molten metal in its plastic state around the work piece as it cools to extrude a sized, stable coating on the work piece.

4,082,870

METHOD FOR COATING NONSYMMETRICAL OBJECTS

Donald McKelvie Yenni, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 645,040
Int. Cl.² B05D *1/02, 1/08*
U.S. Cl. 427—425 **6 Claims**

1. A method for coating objects comprising
(a) rotating said object about a longitudinal axis;
(b) rotating said longitudinal axis about a second axis spaced from and parallel to said longitudinal axis so as to provide translation and rotation of said objects;
(c) correlating the speed and direction of rotation of said longitudinal axis and said second axis;
(d) providing a spray coating device in proximity to said objects for depositing coating material thereon;
(e) depositing coating material on said object as it moves past said spray coating device;
(f) continuing the translation and rotation of said object past said spray coating device until the desired coating is achieved.

4,082,871

METHOD FOR FORMING A DECORATIVE NOVELTY DEVICE

Alan Peters, 28 Westhampton Dr., Weston, Ontario, Canada

Filed Jan. 5, 1977, Ser. No. 756,875
Int. Cl.² B44C *1/16*
U.S. Cl. 428—15 **7 Claims**

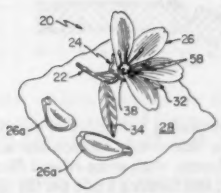
5. A decorative novelty article comprising a washed stone substrate, said stone having at least one thin coating of clear polyurethane solution applied thereto, a decorative element selected from a water soluble decal or a silk screen printing affixed to said polyurethane solution coated stone and at least one thin coating of said clear polyurethane solution applied to said stone over said decorative element.

4,082,872

FLOWER DECORATION

James L. Hughes, 4946 Duebber Dr., Cincinnati, Ohio 45238

Filed Sep. 30, 1976, Ser. No. 728,314
Int. Cl.² A41G *1/00*
U.S. Cl. 428—24 **3 Claims**



1. A flower decoration comprising a base including a stem and a pair of leaves attached thereto and extending outwardly therefrom, one end of said stem and said leaves forming a three-position support, a cup-shaped bell portion representative of the sepal of a flower, and securing means for securing said bell portion to the other end of said stem, said stem extending upwardly from said one end wherein said base, bell portion and securing means are illustrative of a flower, said securing means including a head portion and a spacer portion, said spacer portion engaging the inside bottom surface of said cup-shaped bell portion wherein said head portion is held in spaced relationship to the bottom of said bell portion, a plurality of petal-like members, one end of each of said petal members if formed with a projecting lip, said petal members being positionable at said one end thereof between said bell portion and said head portion, means for holding each of said petal members in detachable fashion wherein said petal members may be individually removed from said bell portion, and in which said holding means is a plurality of indentations formed on the bottom surface of said head portion for receiving said projecting petal lip portion which cooperatively engages said indentation.

4,082,873

SWITCH-PROOF LABEL

Frederick P. Williams, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 2, 1976, Ser. No. 737,950
Int. Cl.² B32B *3/18, 7/10, 7/12;* **C09J** *7/02*
U.S. Cl. 428—40 **6 Claims**

1. A laminated label comprising:
(a) a flexible transparent or translucent plastic film,
(b) having reverse printing on one side thereof in an information containing pattern, and

(c) a layer of pressure sensitive adhesive bonded to the printed side of said plastic film, where

(d) the printed information containing pattern having a greater affinity for the pressure sensitive adhesive than the plastic film,

(e) so that when the laminated label has been mounted upon an object, attempted removal causes delamination of the plastic film and the pressure sensitive adhesive with at least a tamper indicating amount of the printed information pattern remaining adhered to at least a portion of the pressure sensitive adhesive which remains on the object.

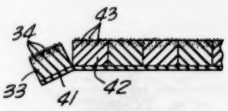
4. A laminated label, as in claim 1, wherein the affinity of the adhesive for the surface to which the laminated label is adhered and to the printed pattern is greater than the affinity of the printed pattern for the outer sheet.

4,082,874

CARPETING AND METHOD AND APPARATUS FOR MAKING CARPETING

Fling Armstrong Traylor, Jr., Hacienda Heights, Calif., assignor to El-Do, Inc., Los Angeles, Calif.

Filed Mar. 14, 1977, Ser. No. 777,128
Int. Cl.² B65D *71/00*
U.S. Cl. 428—54 **28 Claims**



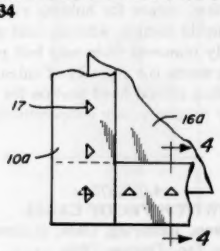
28. Carpeting comprising a plurality of cured, rubber-based elements arrayed in side-to-side relationship and having filaments embedded therein, with some of said filaments projecting upwardly from, and forming a pile on, the upper surface of said elements, and each cured, rubber-based element being bonded by vulcanization along its bottom surface to the surface of a vulcanized, rubber-based sheet with substantially no rubber from the rubber-based sheet projecting between the sides of the rubber-based elements and with some of said filaments projecting downwardly from the bottom surface of the cured, rubber-based elements and penetrating into the surface of said vulcanized, rubber-based sheet.

4,082,875

TAPE HAVING A LONGITUDINAL STRIP OF ADHESIVE WHICH IS USEFUL AS A MEANS FOR FRAMING SHEETS

Samuel Citron, 67 Kemble St., Boston, Mass. 02119

Filed Sep. 23, 1976, Ser. No. 725,980
Int. Cl.² A47G *1/08;* B32B *3/10, 7/14;* C09J *7/02*
U.S. Cl. 428—134 **11 Claims**



1. A tape for use in attaching a sheet to a surface, said tape including an adhesive coat on one face that extends the full length thereof and from one edge part way across said one face with the uncoated portion of said one face to overlie a margin of said sheet, and said tape having a series of indicia extending lengthwise of the tape, each of said indicia a figure including at least one angle providing an apex that represents a particular point lengthwise of the line of demarcation between said coated and uncoated portions of said one face, said indicia located relative to said line to enable said line to be oriented through the tape with respect to reference lines or reference lines to be established with reference to said line, said tape having an adhesive coat along but one side of said extended series of indicia.

4,082,876

METHOD FOR PRODUCING FOAMED BODY HAVING CHEMICAL EMBOSSED PATTERNS AND RESULTANT PRODUCT

Nobuo Miura, Kashiwa, Japan, assignor to Lonseal Corporation, Tokyo, Japan

Filed Feb. 18, 1976, Ser. No. 659,104
Claims priority, application Japan, Feb. 20, 1975, 50-21655
Int. Cl.² B29D *27/00*
U.S. Cl. 428—159 **6 Claims**

1. A method for producing a foamed body having chemically embossed patterns which comprises: forming a composition containing a plasticized polyvinyl chloride resin, a synthetic rubber material capable of forming sulphur bridges, a blowing agent selected from the group consisting of dinitrosopentamethylene tetramine and azobisdicarbonimide, sulphur as the vulcanization agent and a curing asistant into a sheet; printing an ink containing a vulcanization accelerator selected from the group consisting of 2-mercaptobenzothiazole, the zinc salt of 2-mercaptobenzothiazole, the sodium salt of 2-mercaptobenzothiazole, tetramethylthiuram monosulfide, tetramethylthiuram disulfide, piperidine pentamethylene dithiocarbamate, zinc diethyl dithiocarbamate and zinc-dibutylxanthate onto said sheet in a desired configuration; drying and curing the printed sheet by heating said printed sheet to a temperature of 90°–100° C for at least 20 hours; and heating said dried sheet to a temperature of 180°–210° C to cause foaming of said sheet thereby generating a sheet having said chemically embossed patterns therein.

3. An embossed foamed body prepared by the method of claim 1.

4,082,877

UNORIENTED COMPOSITE LAMINAR FILM WITH AN ELASTOMERIC LAYER AND SEALABLE LAYER

Robert James Shadle, Greenville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Feb. 14, 1975, Ser. No. 550,074
Int. Cl.² B65D *33/00, 33/04, 85/30, 85/34*
U.S. Cl. 428—35 **31 Claims**

1. A substantially unoriented composite laminar film having a 10 percent tensile secant modulus of from about 1,000 to about 30,000 pounds per square inch which comprises:

a first layer of elastomeric polymeric composition; and

a sealable layer of a polymeric composition comprising an interpolymer of ethylene and alkenoic acid; and wherein,

said elastomeric polymeric composition comprises a material selected from the group consisting of elastomeric interpolymer of ethylene with an alpha-mono-olefin having from 3 to about 8 carbon atoms per molecule, elastomeric interpolymers of styrene with a conjugated diene, elastomeric interpolymers of ethylene and a vinyl ester of carboxylic acid having from 2 to about 5 carbon atoms per molecule, elastomeric polyurethanes, elastomeric polyes-

ters, elastomeric polyethers, and mixtures thereof; and wherein

said alkenoic acid interpolymer is selected from ionomeric salts of interpolymers of ethylene and an alpha, beta-ethylenically unsaturated carboxylic acid having from 3 to about 10 carbon atoms.

2. The film of claim 1 further including a second sealable layer of a polymeric composition comprising an interpolymer of ethylene and alkenoic acid with said first layer disposed intermediate the sealable layers.

4,082,878
ABSORBENT TEXTILE SHEET MATERIAL

Hans Boe, Augsburg, Germany; Ralf Hoehn, Chelmsford, Mass.; Bohuslav Tecl, Weinheim, and Wilhelm Kirsch, Birkenau, both of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Germany

Continuation-in-part of Ser. No. 712,979, Aug. 9, 1976, abandoned. This application Oct. 26, 1976, Ser. No. 735,713
Claims priority, application Germany, Aug. 16, 1975, 2536440
Int. Cl.² B32B *3/30*
U.S. Cl. 428—195 **7 Claims**

1. An absorbent textile sheet material suitable for use as a cleaning cloth, skid-resistant underlayment or the like, comprising a consolidated nonwoven fabric coated on from about 30% to about 70% of both surfaces with a coagulated foamed dispersion comprising rubber and present as a three-dimensionally superelevated printed pattern providing a squeegee-like action when wiped over a wet surface.

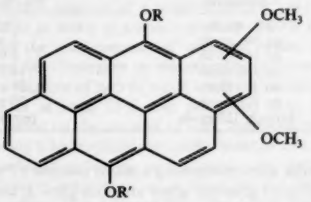
4,082,879
STABILIZED TRANSPARENT RECEPTOR SHEET

Terrence M. Conder, Stillwater, and Kevin P. O'Leary, Arden Hills, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 601,717, Aug. 4, 1975, abandoned. This application Jul. 6, 1976, Ser. No. 702,849
Int. Cl.² B32B *27/08, 27/36*
U.S. Cl. 428—219 **10 Claims**

1. In an imageable receptor sheet comprising a transparent backing having a coating thereover including a film-forming binder, reducible metal soap and an organic reducing agent, the improvement comprising including in said coating from about 0.00007 to 0.005 parts by weight per part of reducible metal soap of a polycyclic aromatic dye compound for the purpose of stabilizing the imaged sheet against background darkening upon prolonged exposure to heat and light, said polycyclic aromatic dye compound exhibiting a development characteristic of at least 150 seconds.

3. The improvement in accordance with claim 1, wherein said dye compound is of the formula

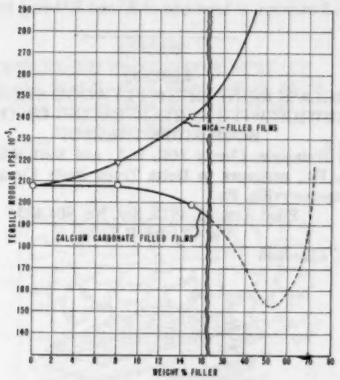


where R and R' are lower alkyl.

4,082,880
PAPER-LIKE THERMOPLASTIC FILM

Vaclav George Zboril, Kingston, Canada, assignor to du Pont of Canada Limited, Montreal, Canada

Continuation of Ser. No. 642,054, Dec. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 499,215, Aug. 21, 1974, abandoned. This application May 23, 1977, Ser. No. 799,434
Claims priority, application Canada, Nov. 22, 1973, 186508
Int. Cl.² B05D *3/00, 7/00*
U.S. Cl. 428—220 **18 Claims**



1. A paper-like, voidless, thermoplastic film having a thickness of from 0.3 mil to 10 mil, said film having been made by a process consisting essentially of the steps of extruding a mixture of

a. 70–98% by weight of a polyethylene having a maximum melt flow index of 5 decigrams per minute, and a density in the range of 0.945 to 0.970 grams per cubic centimeter, and

b. 2–30% by weight of inorganic lamellar filler particles, the largest dimension of said particles being less than 150 microns and said particles having a minimum particle diameter to particle thickness ratio of about 5:1,

through a circular die, in the form of a seamless tubing, continuously withdrawing the tubing from the point of extrusion, expanding and simultaneously cooling the tubing while in the plastic formative state to a blow up ratio in the range of from 1.2:1 to 10.1.

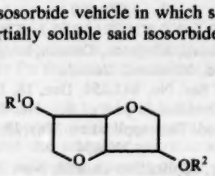
4,082,881
TOPICAL AND OTHER TYPE PHARMACEUTICAL FORMULATIONS CONTAINING ISOSORBIDE CARRIER

James Ling Chen, East Brunswick, and Jean M. Battaglia, North Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 23, 1976, Ser. No. 753,969
Int. Cl.² A61K *31/58*
U.S. Cl. 424—241 **15 Claims**

1. A pharmaceutical composition comprising a pharmaceutical which is a steroid selected from the group consisting of 21-chloro-9α-fluoro-Δ^4-pregnene-11β,16α,17α-triol-3,20-dione and its 16,17-acetonide; 21-chloro-9-fluoro-2′,3′-dihydro-11α-hydroxy-5′-phenylpregna-1,4-dieno[16α, 17-b] [1,4]-dioxin-3,20-dione:acetone solvate and dichloromethane solvate (1:1); 9α-fluoro-11β,16α,17,21-tetrahydroxy-pregna-1,4-diene-3,20-dione 16,17-acetonide, 21-(acetyloxy)-9-fluoro-1′,2′,3′,4′-tetrahydro-11β-hydroxypregna-1,4-dieno[16α,17-b]naphthalene-3,20-dione, progesterone, and Δ′-testololactone or a member selected from the group consisting of econazole or salts thereof, nystatin, neomycin, miconazole, gramicidin, halcinonide, triamcinolone acetonide, griseofulvin or mixtures

thereof, and an isosorbide vehicle in which said pharmaceutical is at least partially soluble said isosorbide having the formula



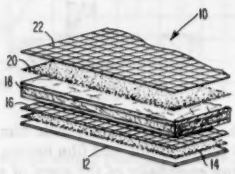
wherein R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen or lower alkyl containing 1 to 5 carbons, at least one of R^1 and R^2 being lower alkyl.

4,082,882

FIBERGLASS REINFORCED PLYWOOD STRUCTURAL SANDWICH WITH ACRYLIC FACING ON ONE OR BOTH SIDES THEREOF

Hyman Weinstein, Cherry Hill, N.J., and Kurt Adler, Erdenheim, Pa., assignors to Delta Truck Body Company, Inc., Montgomeryville, Pa.

Filed Aug. 13, 1975, Ser. No. 604,433
Int. Cl.² B32B *7/00*
U.S. Cl. 428—246 **6 Claims**



1. A sandwich for use as a structural wall of a truck, trailer, van or intermodal container comprised of a consolidated unit including a layer in the form of a sheet of an alkyl methacrylate polymer having all acrylic multiple stage modifiers, the polymer being sequentially produced and characterized by a non-elastomeric hard first stage, an intermediate elastomeric stage and final relatively hard stage, a polyester resin bonded to said acrylic sheet, a ply of fiberglass in the form of a waffle weave of woven roving embedded in and covered by said resin and plywood bonded to said resin on the side of said fiberglass opposite said layer of acrylic composition.

4,082,883

HOT MELT SIZE, YARN SIZED THEREWITH, AND PACKAGES AND FABRICS OF SIZED YARN

Robert C. Malpass, High Point; Walter F. Illman, Greensboro, and Delano M. Conklin, Burlington, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 286,946, Sep. 7, 1972, abandoned. This application Mar. 16, 1977, Ser. No. 778,080
Int. Cl.² C08K *5/05, 5/10, 5/13;* C08L *67/02*
U.S. Cl. 428—253 **24 Claims**

1. A quick-setting non-aqueous water-extractable textile melt size composition comprising an intimate admixture of a water-soluble film-forming meltable thermoplastic polymer and a melt-miscible, solid modifier selected from the class consisting of aliphatic and aromatic carboxylic acids, partial esters thereof, non-polymeric polyhydric alcohols, phenolic acids, and polyhydric phenols, wherein the proportion of polymer to modifier is about 90:10 to about 50:50 on a weight basis, said size capable of being applied as a melt to textile yarns, with quick setting when exposed to ambient conditions, and capable of being removed from the yarns by aqueous or alkali extraction.

4,082,884

METHOD OF REDUCING FOULING OF MARINE STRUCTURES AND COATED STRUCTURE THEREOF

Charles F. De Long, Washington, D.C., assignor to United States Trading International, Inc., Washington, D.C.

Filed Sep. 19, 1975, Ser. No. 614,927
Int. Cl.² B05D *3/02, 3/04;* B32B *7/00*
U.S. Cl. 428—262 **15 Claims**

1. A marine structure protected against fouling by marine organisms consisting of a watercraft or stationary marine structure coated below the water line with a hard-surface leaching-type anti-fouling paint and overcoated with an anti-fouling composition consisting essentially of an aqueous solution or dispersion of a carboxylated hydrophilic acrylic polymer, a cross-linking agent for the carboxylated hydrophilic acrylic polymer, polyethylenimine or a hydrophilic polyethylenimine derivative and an effective amount of an ultraviolet-absorbing agent.

8. A method of reducing the fouling tendency of watercraft and stationary underwater structures consisting of applying below the water line of the watercraft or underwater structure precoated with hard-surface leaching-type anti-fouling paint an anti-fouling composition consisting essentially of an aqueous solution or dispersion of a carboxylated hydrophilic acrylic polymer, a cross-linking agent for the carboxylated hydrophilic acrylic polymer, polyethylenimine or a hydrophilic polyethylenimine derivative and an effective amount of an ultraviolet-absorbing agent.

4,082,885

FIRE RESISTANT ASPHALT ROOFING SHINGLES

Sheikh A. Rashid, Chicago; Hugh S. Bray, Mount Prospect, and Edward J. Boarini, Arlington Heights, all of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 537,286, Dec. 30, 1974, abandoned. This application Jul. 1, 1976, Ser. No. 701,841
Int. Cl.² E04D *1/00*
U.S. Cl. 428—281 **6 Claims**

3. A fire resistant and weathering resistnat shingle or surface covering material ecologically desirable in its utilization of disposable glass, said shingle comprising a felt base sheet saturated with a bitumen and coated on at least one side with a filled asphalt coating, said asphalt coating prior to its filling having a penetration of from 5 to 40 mm. at 77° F. and a softening point of from 180° F. to 250° F., said filled asphalt having a combination of granular glass and non-glass granular mineral filler therein in an amount of from 10 to 55% by weight, based on the weight of the asphalt, said granular glass and said non-glass granular mineral filler each having a particle size distribution of

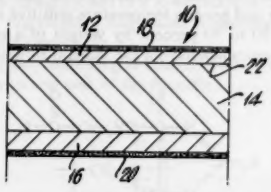
Sieve Analysis (U.S. Std. Screen)	
Cumulative	Wt. % Range
60 mesh	.2 to 20
on 80 mesh	2 to 29
on 100 mesh	4 to 35
on 140 mesh	14 to 46
on 200 mesh	34 to 61
on 325 mesh	70 to 90
through 325 mesh	remainder,

said granular glass comprising a major portion by weight of the combination of granular glass and non-glass granular mineral filler, and said filled asphalt coating comprising from about 25% to about 45% by weight of the finished shingle.

4,082,886
LIQUID ABSORBENT FIBROUS MATERIAL AND METHOD OF MAKING THE SAME

George A. M. Butterworth, Western Springs, and Robert T. Elias, Downers Grove, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 15, 1977, Ser. No. 824,380
Int. Cl.[2] B32B 3/00
U.S. Cl. 428—284 31 Claims



1. A high loft, low density, nonwoven fibrous material having good wet strength, softness, abrasion resistance, and liquid absorbency and retention which comprises a plurality of irregularly arranged, intersecting, overlapping, mechanically interengaged, loosely assembled fibers including both natural wood pulp fibers and synthetic wood pulp fibers, said two types of fibers being present in different proportions in various regions positioned parallel to the median plane of the material, said regions including a first facing region in which synthetic wood pulp fibers are present in an amount from about 6 percent to about 30 percent by weight of the fibers, a second absorbent reservoir region in which synthetic wood pulp fibers are present in a smaller proportion than the proportion of synthetic wood pulp fibers in said first region, and a third capillary distribution network region in which synthetic wood pulp fibers are present in a proportion greater than the proportion of synthetic wood pulp fibers in said second region but less than the proportion of synthetic wood pulp fibers in said first region, said first and third regions being located on opposite sides of said second region, the melting point of said synthetic wood pulp fibers being lower than the melting point of all other fibers in said fibrous material, segments of said synthetic wood pulp fibers being heat fused with other segments of synthetic wood pulp fibers and with segments of other fibers at a plurality of junctures throughout said fibrous material to form a self-supporting fibrous structure which does not require any additional binder.

4,082,887
COATING COMPOSITION FOR A FIBROUS NONWOVEN SHEET OF POLYOLEFIN

Don Mayo Coates, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 14, 1976, Ser. No. 686,509
Int. Cl.[2] C09D 3/00
U.S. Cl. 428—289 12 Claims

1. A coating composition which when applied on a fibrous nonwoven sheet of polyolefin and dried provides a sheet having antistatic properties, high water barrier and antislip properties, said composition consisting essentially of

(a) an effective amount of a water-insoluble wax which is dispersable in water at a concentration of 10% by weight based on the total amount of wax and water, said wax requiring for dispersion in water only a nonionic surfactant or a mixture of two or more nonionic surfactants in an amount of at least 15% and not more than 100% by weight based on the amount of wax, said nonionic surfactant having a hydrophilic-lipophilic balance of from about 6–10, said wax providing said water barrier properties;

(b) an effective amount of an antistat having the formula $M_nR_{3-n}PO_4$ where M is selected from the group consisting of lithium, sodium, potassium and ammonium ions, R represents an alkyl group containing from 3 to 5 carbon atoms, and n is selected from the integers 1 and 2;

(c) a nonionic surfactant having a hydrophilic-lipophilic balance of from about 6–10, said surfactant being present in an amount of from about 15–100% by weight based on the amount of wax;

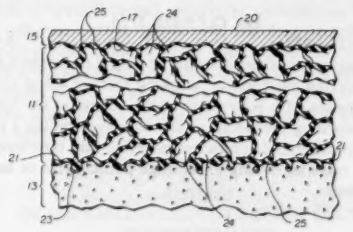
(d) a water-insoluble binder resin capable of wetting the polyolefin sheet, having a Tg of from about 20°–50° C and which, in the form of an aqueous dispersion, does not coagulate in the presence of the antistat; and

(e) water; solids being present in said composition in an amount of from about 10–40% by weight.

4,082,888
CUSHIONED PROTECTIVE SURFACE

Henry E. Portin, 1834 N. 183rd, Seattle, Wash. 98133

Filed Apr. 16, 1976, Ser. No. 677,744
Int. Cl.[2] B32B 5/16
U.S. Cl. 428—327 8 Claims



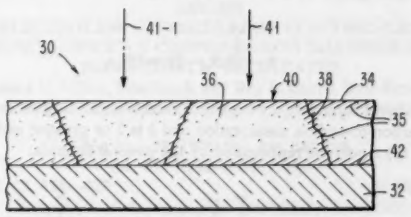
1. A base surface coated with a composition comprising:

a catalyst-free mixture of (1) particles of resiliently deformable vulcanized rubber particles between 1/10 millimeter and 6 millimeters in size, wherein said particles comprise between 55 and 65% of said mixture by weight, and (2) an aqueous latex solution comprising elastic rubber solids dissolved in water, wherein said resilient rubber solids comprise between 55 and 65% of said latex solution by weight.

4,082,889
LUMINESCENT MATERIAL, LUMINESCENT THIN FILM THEREFROM, AND OPTICAL DISPLAY DEVICE THEREWITH

Thomas Herman DiStefano, Tarrytown, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1976, Ser. No. 652,962
Int. Cl.[2] B32B 5/16
U.S. Cl. 428—328 32 Claims



1. A polycrystalline semiconductor material comprising individual grains each one of which contains an impurity or impurities arranged especially such that they dope the grain to provide majority carriers of a given density distribution,

said grain of semiconductor material containing dopant

producing charge carriers of substantially one conductivity type, and

said density of majority carriers being substantially higher in the immediate, finite region near the grain surface than in the region near the center of the grain, and

said grains being of average size smaller than the minority carrier diffusion length in bulk semiconductor material of the same type and doping density as the material in the center of the grain.

4,082,890

DECORATIVE SHEET MATERIAL

Arthur Burton, Denton, and David Robert Reed, Hyde, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 10, 1975, Ser. No. 630,686

Claims priority, application United Kingdom, Nov. 27, 1974, 51363/74

Int. Cl.² B32B *5/16*

U.S. Cl. 428—328 **5 Claims**

1. A decorative sheet material having a decorative surface and a working surface, the working surface being provided with a coating of a water-activatable adhesive, the improvement comprising providing on the adhesive coating a coating of a dry powdered deliquescent material, said powdered deliquescent material having an average particle size of less than 200 microns.

4,082,891

POLYCARBONATE COATED WITH PHOTOCURABLE POLYTHIOL AND DIFFERENT POLYENES

Herbert Leard Curry, Lenox, Mass., and Walter Lawrence Hall, Mount Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

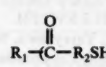
Filed May 4, 1976, Ser. No. 683,065

Int. Cl.² B32B *27/36*

U.S. Cl. 428—412 **7 Claims**

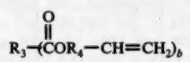
1. A coated polycarbonate article having a coating thereon containing:

(a) a polythiol represented by the general formula:



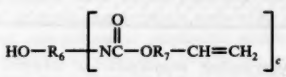
wherein R_1 and R_2 are organic moieties containing no reactive carbon-to-carbon unsaturation and a is 2 to 4;

(b) a polyene represented by the general formula:



wherein R_3 and R_4 are organic moieties containing no reactive carbon-to-carbon unsaturation and b is 2 or greater; and

(c) a polyene represented by the general formula:



wherein R_6 and R_7 are organic moieties containing no reactive carbon-to-carbon unsaturation and c is 1 or greater, and wherein (a) and (b) plus (c) are used in stoichiometric amounts.

4,082,892

TEMPERATURE SENSITIVE GLASS ASSEMBLY HAVING AN AQUEOUS INTERLAYER OF AN OXAZOLINE SOLUTION

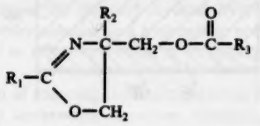
John Adams Frump, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Oct. 12, 1976, Ser. No. 731,079

Int. Cl.² B32B *17/06*

U.S. Cl. 428—332 **10 Claims**

1. A temperature responsive combination for transmitting or reflecting light comprising a double-paned glass assembly and lying between said panes a temperature sensitive aqueous solution of from 10 to 50 percent by weight of a compound or mixture of compounds having the general formula



wherein

R_1 is a lower alkyl of from 1 to 3 carbon atoms, R_2 is selected from the group consisting of hydrogen, methyl, ethyl and hydroxymethyl, and R_3 is selected from the group consisting of methyl, ethyl, propyl and methylethenyl.

4,082,893

POROUS POLYTETRAFLUOROETHYLENE TUBINGS AND PROCESS OF PRODUCING THEM

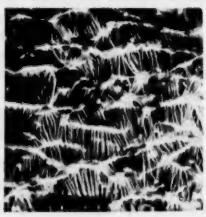
Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 17, 1976, Ser. No. 751,876

Claims priority, application Japan, Dec. 24, 1975, 50-155226; Apr. 29, 1976, 51-49671

Int. Cl.² D02G *3/00*

U.S. Cl. 428—376 **10 Claims**



1. A porous polytetrafluoroethylene tubing having a microporous structure comprising fibers of and nodes of the polytetrafluoroethylene connected with each other and wherein the microporous structure differs between the inner surface portion of said tubing and the outer surface portion of said tubing.

4,082,894

POLYCARBONATE RESIN SHAPED ARTICLES HAVING IMPROVED ABRASION RESISTANCE

Motoaki Yoshida, Takarazuka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Mar. 26, 1976, Ser. No. 670,867

Claims priority, application Japan, Mar. 26, 1975, 50-37237

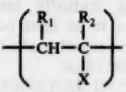
Int. Cl.² B05D *1/38, 7/02;* B32B *27/08*

U.S. Cl. 428—335 **14 Claims**

1. A polycarbonate resin shaped article having a cured coating of a melamine-type resin on its surface through a primer layer resulting from the solidification or curing, in the presence or absence of a crosslinking agent and a crosslinking catalyst, of a primer comprising

(A) a polymer containing at least 5 mole% of a recurring structural unit of the formula

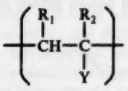
(I)



wherein R_1 and R_2, independently from each other, represent a hydrogen atom or a lower alkyl or carboxyl group, and X represents a side chain containing a carboxyl or carbamoyl group, or

(B) a polymer containing at least 2.5 mole% each of a recurring structural unit of the formula

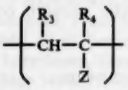
(II)



wherein R_1 and R_2 are the same as defined above and Y represents a hydroxyl-containing side chain,

and a recurring structural unit of the formula

(III)



wherein R_3 and R_4, independently from each other, represent a hydrogen atom or a lower alkyl or carboxyl group, and Z represents a side chain containing a carboxyl group, an amino group, a substituted amino group, an epoxy group or a tetrahydrofuryl group.

4,082,895

LAYERED COMPOSITE OF OVERPOLYMER RUBBERS AS TOUGHENERS AND THERMOSET AND THERMOPLASTIC MOLDING COMPOSITIONS

Richard Harold Backderf, Richfield, and Clifford Dale Guiley, Jr., Medina, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 628,994, Nov. 5, 1975, Pat. No. 4,026,970. This application Dec. 27, 1976, Ser. No. 754,776

Int. Cl.[2] B32B *27/36, 27/38, 27/08*

U.S. Cl. 428—412 **11 Claims**

1. A composition comprising (A) a thermoplastic or thermoset resin molding compound and (B) from about 0.5 part to about 15 parts by weight based on 100 parts by weight of the resin of an overpolymer comprised of (1) a hard graft-linked core having a Tg value of over about 20° C. and comprised of interpolymerized units of from about 50 percent to about 80 percent by weight of acrylonitrile, from about 19 percent to about 40 percent by weight of a copolymerizable vinylidene monomer, and from about 0.1 percent to about 10 percent by weight of a graft-linking monomer, (2) a cross-linked rubbery shell having a Tg value of below about 0° C. containing from about 0.1 percent to about 10 percent by weight based on the total weight of the shell of a crosslinking monomer, and (3) a hard overcoat having a Tg value of over about 20° C.; said core, shell, and overcoat present in a weight ratio of from about 1:0.7 to 5.0:0.4 to 4.0 based on the core.

4,082,896

ABRASION RESISTANT COATINGS

Arthur A. Wegwerth, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 561,705, Mar. 25, 1975, abandoned. This application Mar. 10, 1976, Ser. No. 665,412

Int. Cl.[2] B32B *27/38;* **C08L** *1/14, 1/28*

U.S. Cl. 428—413 **12 Claims**

1. A cured, thermoset composition comprising the product of an epoxy-terminated silane cured in the presence of from 0.05 to 5% by weight of a polymer from the group consisting of polyvinyl butyral, polyvinyl formal, polyvinyl pyrrolidone, ethylcellulose, cellulose acetate propionate, cellulose acetate butyrate, and polyvinylchloride, said composition comprising at least 15% by weight of a cured epoxy-terminated silane and exhibiting no more than 30% haze according to ASTM D-968-51.

2. A cured, thermoset composition bonded to a substrate, said composition comprising the product of an epoxy-terminated silane cured in the presence of from 0.05 to 5% by weight of a polymer from the group consisting of polyvinyl butyral, polyvinyl formal, polyvinyl pyrrolidone, ethylcellulose, cellulose acetate propionate, cellulose acetate butyrate, and polyvinylchloride wherein said composition was bonded to said substrate during cure of said composition, said composition comprising at least 15% by weight of a cured epoxy-terminated silane and exhibiting no more than 30% haze according to ASTM D-968-51.

4,082,897

GLASS LAMINATION UTILIZING CYCLIC PHOSPHONATES

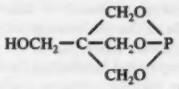
Ingenuin Hechenbleikner, West Cornwall, Conn., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 694,580, Jun. 10, 1976, which is a division of Ser. No. 565,699, Apr. 7, 1975, Pat. No. 3,978,166. This application Jun. 21, 1977, Ser. No. 808,632

Int. Cl.[2] B32B *17/06*

U.S. Cl. 428—426 **8 Claims**

1. A process of preparing a cross-linked polymeric phosphonate and laminating glass therewith consisting essentially of heating at 160 to 250° C pentaerythritol phosphite monomer of the formula



without another alcohol until it self-polymerizes to form said phosphonate and laminating two glass surfaces together with said polymer.

4,082,898

ELECTROLESS DEPOSITION OF ELECTRICALLY NONCONDUCTIVE COPPER-BORON COATINGS ON NONMETALLIC SUBSTRATES

Richard G. Miller, Pittsburgh, and Roy L. Cavitt, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 23, 1975, Ser. No. 589,108

Int. Cl.[2] B32B *9/00, 17/06*

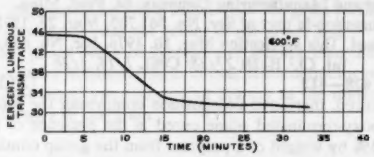
U.S. Cl. 428—427 **18 Claims**

1. A method of depositing an electrically nonconductive copper boron film onto a non-metallic substrate comprising the steps of:

a. sensitizing a surface of the substrate, and

b. contacting the sensitized surface of the substrate with an alkaline aqueous solution comprising a copper salt and an alkali metal borohydride at a pH of at least about 12 in the

presence of a complexing agent for copper in sufficient amount to deposit a copper boron film in about 30 seconds



to about 3 minutes at a temperature between about 70° F. and 120° F. (about 20° C. to 50° C.).

4,082,899

METHOD OF APPLYING CATALYSTS FOR ELECTROLESS DEPOSITION AND ARTICLE

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Filed Sep. 7, 1976, Ser. No. 720,588

Int. Cl.[2] C23C *3/02*

U.S. Cl. 428—457 **11 Claims**

1. A method for preparing a substrate prior to electroless (chemical) metal deposition comprising the step of treating said substrate with a catalytic composition comprising a sensitizer and a catalytic metal and wherein said sensitizer comprises aged tin(IV) and tin(II) and wherein said tin(IV) in said aged tin(IV) is in excess relative to tin(II).

4,082,900

CHEMICAL APPARATUS FREE FROM CREVICE CORROSION

Kazutoshi Shimogori, Kobe; Hiroshi Sato, Suita, and Haruo Tomari, Takasago, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Mar. 15, 1976, Ser. No. 666,562

Claims priority, application Japan, Mar. 14, 1975, 50-31708; Mar. 14, 1975, 50-31709

Int. Cl.[2] B32B *15/04*

U.S. Cl. 428—469 **5 Claims**

1. In a chemical apparatus subject to crevice corrosion, having inner surfaces at least partly constituted by titanium material, the improvement which comprises:

a coating firmly bonded to at least the crevice positions of said inner surfaces by means of an anti-corrosive metal of a mixed oxide layer at least 0.01 microns thick and comprising an oxide of the platinum group and an oxide of an anti-corrosive metal; wherein,

the platinum group metal is selected from the group consisting of platinum, iridium, osmium, palladium, rhodium and ruthenium,

the anti-corrosive metal is selected from the group consisting of titanium, tantalium, zironium, niobium, silicon and aluminum,

the molar ratio of said platinum group oxide to said anti-corrosion metal oxide is within the range of from 1:99 to 95:5, and

said mixed oxide layer covers at least 1/1000 of the surface layer of said titanium material.

4,082,901

THERMOGRAPHIC MATERIAL

Urbain Leopold Laridon, Wilrijk; Albert Lucien Poot, Kontich, and Jozef Frans Willems, Wilrijk, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

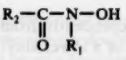
Division of Ser. No. 457,547, Apr. 3, 1974, Pat. No. 3,996,397. This application Dec. 5, 1975, Ser. No. 637,967

Claims priority, application United Kingdom, Apr. 4, 1973, 16166/73; Jun. 19, 1973, 29073/73

Int. Cl.[2] B32B *5/00;* B41M *5/18*

U.S. Cl. 428—480 **9 Claims**

1. A thermographic light insensitive recording material comprising a support and uniformly carried on said support a reducing compound according to one of the following general formulae I or II and a reducible noble metal salt that is generally non-light-sensitive in the temperature range of 50° to 200° C, said compounds being mutually interreactive in an oxidation-reduction reaction to at least one visible distinct reaction product when heated together at a temperature above 60° C:



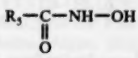
(I)

wherein:

R_1 represents hydrogen, an aliphatic group containing up to about four carbon atoms; and

R_2 represents an alkoxy group containing up to 18 carbon atoms, an aryloxy group, an amino group of the formula

in which R_3 and R_4 (same or different) represent hydrogen, an aliphatic group or an aromatic group, or R_3 and R_4 represent together the necessary atoms to close a 5- or 6-membered heterocyclic nitrogen containing nucleus; and



(II)

wherein:

R_5 is an aromatic group, said organic reducing compound being present in an effective amount to reduce said salt when said heat pattern has a temperature of at least about 60° C.

4,082,902

SPARK-RECORDING TYPE PRINTING METHOD AND SPARK-RECORDING MATERIAL FOR USE THEREOF

Akira Suzuki; Keiji Kubo; Suguru Kunitake, and Fumiaki Arai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Sep. 10, 1974, Ser. No. 504,709

Claims priority, application Japan, Sep. 18, 1973, 48-10525; Sep. 26, 1973, 48-107611; Sep. 26, 1973, 48-107612; Oct. 3, 1973, 48-110502; Oct. 3, 1973, 48-110503; Nov. 26, 1973, 48-131730; Dec. 3, 1973, 48-134260

Int. Cl.[2] G01D *15/08, 15/34;* B41N *1/00;* B41C *1/10*

U.S. Cl. 428—457 **14 Claims**

1. A spark-recording material for use in offset printing, which comprises a support, a colored layer based on oleophilic resin and colorant, a layer of metal deposited by vacuum evaporation, a protective layer based on either (a) hydrophilic polymer or (b) polymer and acid-soluble polyvalent metal compound, and a desensitized layer based on desensitizing substance.

4,082,903

TREE FOLIAGE EXTENDERS AND FILLERS FOR WOOD ADHESIVES

Suezone Chow, Vancouver, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 25, 1977, Ser. No. 771,992

Claims priority, application Canada, Feb. 27, 1976, 246732

Int. Cl.[2] C08L *1/02*

U.S. Cl. 428—514 **14 Claims**

1. An adhesive composition for bonding wood comprising (a) a wood adhesive, and

(b) finely divided tree foliage as extender or as extender-plus-filler.

4,082,904

CONTROL OF PRECURE IN COMPOSITION BOARD MANUFACTURE

Leopold F. Bornstein, Tucker, Ga., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Apr. 26, 1976, Ser. No. 680,598
Int. Cl.[2] B32B *21/02, 27/42;* **C08L** *61/20*
U.S. Cl. 428—528 **20 Claims**

5. A cured composition board having improved surface and strength characteristics, said board comprising comminuted cellulosic materials bonded into a unitary mass by a thermoset amine-aldehyde resin, said resin having added thereto, at least in the regions adjacent to the surface of said board, a water soluble thiosulfate salt selected from the group consisting of sodium thiosulfate, potassium thiosulfate, and ammonium thiosulfate in an amount from about 1 to about 5% by weight of the resin to prevent surface precure of said resin.

4,082,905

PRODUCTION OF IRON OXIDE PIGMENTS WITH IMPROVED RESISTANCE TO OXIDATION

Bernd Stephan, Bederkesa; Franz Hund, and Wilhelm Holznagel, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 16, 1977, Ser. No. 797,154
Claims priority, application Germany, Jun. 4, 1976, 2625106
Int. Cl.[2] C09C *1/24*
U.S. Cl. 428—538 **9 Claims**

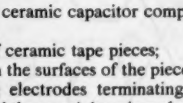
1. An Fe_3O_4 iron oxide black pigment having incorporated therein up to about 50 mole percent of γ-Fe_2O_3 plus $MeFe_2O_4$ (wherein Me is at least one of magnesium, manganese, cobalt, nickel, aluminum, chromium, titanium, copper, zinc and cadmium) having a specific surface according to BET of greater than about 12 m^2/g, up to about 10% by weight of a substantially insoluble inorganic compound as coating and a stability to oxidation with air under standardized conditions of greater than about 130° C.

4,082,906

LOW TEMPERATURE FIRED CERAMIC CAPACITORS

Rajnikant B. Amin, Valencia, Calif.; Harlan Urie Anderson, Rolla, Mo., and Charles E. Hodgkins, Lake View Terrace, Calif., assignors to San Fernando Electric Manufacturing Company, San Fernando, Calif.

Filed Feb. 14, 1977, Ser. No. 768,182
Int. Cl.[2] H01B *3/12;* **H01G** *1/01;* **C04B** *35/46*
U.S. Cl. 428—539 **7 Claims**



1. A multi layer ceramic capacitor comprising, in combination:

(a) a plurality of ceramic tape pieces;

(b) electrodes on the surfaces of the pieces with some of the pieces having electrodes terminating adjacent to their front edges and the remaining pieces having the electrodes terminating adjacent to their rear edges, the pieces with the electrodes terminating adjacent to their front edges being sandwiched between said remaining pieces to provide a stack;

(c) top and bottom ceramic pieces without any electrodes positioned on the top and bottom of said stack to provide a multi layer ceramic capacitor with buried electrodes, the ceramic composition of each of said ceramic tape pieces including, by weight:

(1) at least 50% barium titanate, and

(2) from 0.25% to 10% lithium fluoride, and the electrode composition of each of the buried electrodes including, by weight, at least 50% silver.

6. A process of making a multi-layer ceramic capacitor including the steps of:

(a) forming a ceramic tape composition of, by weight, at least 50% barium titanate and from 0.25% to 10% lithium fluoride;

(b) cutting the ceramic tape to provide a plurality of ceramic tape pieces;

(c) forming an electrode composition of silver and palladium in which there is provided at least 50% by weight of silver;

(d) silkscreening said electrode composition on the surfaces of the tape pieces with some of the pieces having the electrodes terminating adjacent to their front edges and the remaining pieces having the electrodes terminating adjacent to their rear edges;

(e) sandwiching the pieces with the electrodes terminating adjacent to their front edges between the remaining pieces to provide a stack;

(f) affixing ceramic pieces without any electrodes on the top and bottom of said stack to provide a multi-layer ceramic capacitor with buried electrodes; and

(g) sintering the composition at a temperature between 750° C and 1250° C.

4,082,907

THIN MOLYBDENUM COATINGS ON ALUMINUM FOR SOLAR ENERGY ABSORPTION

Daniel Joseph Schardein, and Ruth Diane Lloyd, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 615,245, Sep. 22, 1975, abandoned. This application Jun. 3, 1977, Ser. No. 803,292
Int. Cl.[2] B32B *15/20*
U.S. Cl. 428—640 **9 Claims**

1. A thin, adherent coating on a panel made from aluminum and alloys thereof, comprising a near-monatomic layer of molybdenum and oxides thereof that is highly absorptive to solar energy and has a low emissivity for thermal energy, said panel being a structural element of a solar energy collector and said coating having an absorptivity of about 0.91 in sunlight and an emissivity of about 0.16 at 300° F.

4,082,908

GOLD PLATING PROCESS AND PRODUCT PRODUCED THEREBY

John J. Vanaglash, Jr., Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Filed May 5, 1976, Ser. No. 683,337
Int. Cl.[2] B32B *15/00;* **C22C** *19/03*
U.S. Cl. 428—672 **11 Claims**

1. A metal plating process independent of application of electrical power to the workpiece comprising the steps of:

a. providing a workpiece having a nickel based finish, said finish being at least 85% by weight nickel; and

b. treating said workpiece with a bath comprising a plating source component and a buffering component, said plating source component comprising one or more gold containing compounds wherein said gold is capable of alloying with said nickel of said nickel based finish, said treating being conducted for a time and at a temperature sufficient to provide a layer on said workpiece, said layer comprising an alloy of nickel and gold, said layer having a molecular ratio of nickel to gold of from 1:1 to 6:1, and wherein the source of said nickel in said layer is the nickel from said nickel based finish.

4,082,909

RUBBER COMPOSITION CONTAINING METAL SALT OF HYDROXY BENZOIC ACID

Yuichi Sugiyama; Hiroyuki Kaido, and Tsuneo Koyama, all of Hiratsuka, Japan, assignors to The Yokohama Rubber Company, Limited, Tokyo, Japan

Filed Mar. 26, 1976, Ser. No. 670,758
Claims priority, application Japan, May 22, 1975, 50-60199
Int. Cl.[2] C08K 5/13
U.S. Cl. 526—4 5 Claims

1. A vulcanized rubber product reinforced with metallic cords which comprises rubber composition comprising 0.5 – 20 wt. parts of a metal salt of hydroxybenzoic acid per 100 wt. parts of a rubber.

4,082,910

MULTI-STAGE ISOLATION OF HIGH PRESSURE POLYETHYLENE

Oskar Buechner, Dudenhofen; Gottfried Schlichthaerle, Neustadt, and Friedrich Urban, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed May 19, 1976, Ser. No. 687,873
Claims priority, application Germany, May 31, 1975, 2524204
Int. Cl.[2] C08F 6/26, 6/28
U.S. Cl. 528—481 5 Claims

1. In a process for the manufacture of ethylene polymers by the continuous homopolymerization or copolymerization of ethylene in a polymerization zone at pressures of from 500 to 5,000 bars and at temperatures of from 50° to 450° C, followed by the isolation of the resulting polymer from the reaction mixture, the improvement which comprises: isolating the resulting ethylene polymer in a two-stage isolation zone at pressures in the first stage of the isolation zone of from 100 to 500 bars and pressures in the second stage of the isolation zone of from 1 to 10 bars and at from 100° to 400° C, wherein the mean product residence time in the isolation zone is varied during the continuous process within the range of from 0.5 to 60 minutes, long residence times within the range of from 0.5 to 60 minutes in the isolation zone being used to achieve a low molecular weight ethylene polymer and short residence times within the range of from 0.5 to 60 minutes being used to achieve a high molecular weight ethylene polymer.

4,082,911

PROCESS FOR THE PREPARATION OF NUCLEOSIDES

Helmut Vorbruggen, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Feb. 23, 1976, Ser. No. 660,675
Claims priority, application Germany, Feb. 24, 1975, 2508312
Int. Cl.[2] C07H 19/06, 19/16
U.S. Cl. 536—23 11 Claims

1. In a process for preparing a nucleoside by catalytically condensing a silylated organic base convertible to a nucleoside with a 1-O-acyl, 1-O-alkyl or 1-halo derivative of a masked sugar convertible to a nucleoside to form a nucleoside of said base and said sugar, the improvement which comprises:

employing a catalyst for said condensation consisting essentially of a trialkylsilyl ester of an esterifiable mineral acid or of a strong sulfonic acid, each alkyl being of 1–6 carbon atoms and said acid having a $-H_o$ constant of at least 12.00, whereby a nucleoside of said base is formed containing principally the β-derivative of said sugar.

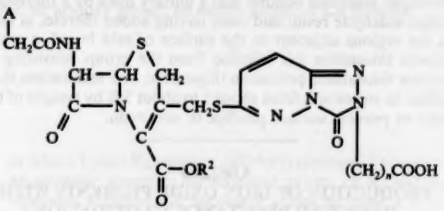
4,082,912

CERTAIN 7-ACYLAMIDO-3-(2-CARBOXYALKYL-2,3-DIHYDRO-S-TRIAZOLO[4,3-b]PYRIDAZIN-3-ON-6-YLMETHYL-3-CEPHEM-4-CARBOXYLIC ACIDS THEIR SALTS AND EASILY HYDROLYZED ESTERS

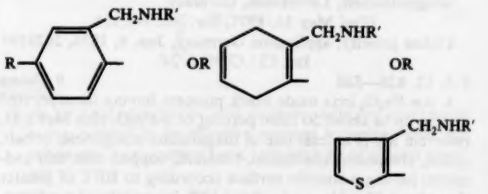
Takayuki Naito, Kawasaki; Jun Okumura, Yokohama; Hajime Kamachi, Ichikawa; Seiji Iimura, Tokyo; Hideaki Hoshi, Ichikawa, and Masahisa Oka, Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 701,443, Jun. 30, 1976, abandoned. This application Apr. 5, 1977, Ser. No. 784,885
Int. Cl.[2] C07D 501/20; A61K 31/545
U.S. Cl. 544—26 36 Claims

1. A compound having the formula



wherein n is one or two and A represents



wherein R is hydrogen, hydroxy or methoxy; R′ is hydrogen or methyl; and R^2 is hydrogen, pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3-phthalidyl or 5-indanyl.

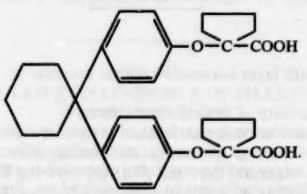
4,082,913

PHENOXYALICYCLIC CARBOXYLIC ACID DERIVATIVES

Yoshio Suzuki, Itami; Masayoshi Minai, Moriyama; Noritaka Hamma, Sakai; Eiichi Murayama, Takarazuka, and Shunji Aono, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 30, 1973, Ser. No. 365,277
Claims priority, application Japan, Jun. 1, 1972, 47-54849
Int. Cl.[2] C07C 69/76
U.S. Cl. 560—102 1 Claim

1. A compound of the formula,

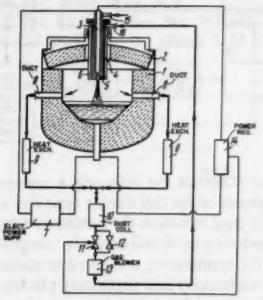


4,082,914

METHOD OF STABILIZING ARC VOLTAGE IN PLASMA ARC FURNACE AND APPARATUS FOR EFFECTING SAME

Nikolai Iosifovich Bortnichuk, ulitsa Ermolovoi, 17, kv. 23, Moscow; Valery Pavlovich Davydov, ulitsa Mayakovskogo, 18A, kv. 7, Elektrougli Moskovskoi oblasti; Mikhail Mironovich Krutyansky, Leninsky prospekt, 91, kv. 412, Moscow; Vladimir Sergeevich Malinovsky, prospekt Mira, 14, kv. 24, Khimki Moskovskoi oblasti, and Vladimir Alexeevich Khotin, Zelenodolskaya ulitsa, 14, korpus 2, kv. 65, Moscow, all of U.S.S.R.

Continuation-in-part of Ser. No. 468,546, May 9, 1974, abandoned. This application May 21, 1976, Ser. No. 688,941
Claims priority, application U.S.S.R., May 14, 1973, 1914193
Int. Cl.[2] H05H *1/24;* H01J *37/305*
U.S. Cl. 13—2 P 5 Claims



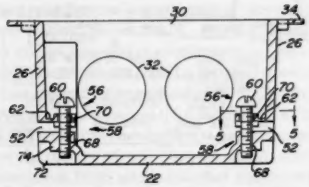
3. A plasma-arc apparatus comprising a furnace; at least one plasmatron within said furnace and including a housing, an axially extending electrode and a nozzle located within said housing; means for supplying a plasma-arc generating gas between said electrode and said nozzle; an annular passage between said nozzle and said housing; at least one duct connected to said furnace for the withdrawal of the furnace gas therefrom; a heat exchanger connected to said duct for cooling the withdrawn gas; conduit means connecting said heat exchanger with said annular passage; and means for withdrawing the furnace gas through said duct and said heat exchanger to and through said annular passage, to thereby cool a peripheral area of said plasmatron and enable the maintenance of an increased plasma-arc voltage.

4,082,915

ELECTRICAL JUNCTION BOX

Harry Silver, 1844 Meadowbrook Rd., Abington, Pa. 19001

Filed Dec. 21, 1976, Ser. No. 753,068
Int. Cl.[2] H02G *3/08*
U.S. Cl. 174—51 14 Claims



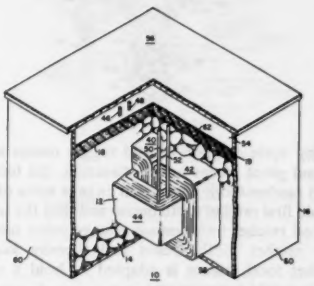
1. An electrical connection box comprising a hollow, integrally formed housing having at least one wall, said wall including an opening therein configured to receive an electrical conductor therethrough and into the interior of the box and tightenable clamping means disposed adjacent to said opening for clamping said conductor in place, said clamping means including a contact shoe integrally formed with said housing and being breakable therefrom at a break point when said conductor is to be clamped to enable the shoe to be brought into clamping engagement with said conductor upon the tightening of said clamping means.

4,082,916

ENCAPSULATED ELECTRICAL INDUCTIVE APPARATUS

Albin Jaklic, Jr., Sharon, and Donald S. Stephens, Sharpsville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1976, Ser. No. 751,782
Int. Cl.[2] H01F *27/22*
U.S. Cl. 174—52 PE 16 Claims



1. An encapsulated electrical inductive apparatus comprising:

an electrical inductive apparatus;

a case surrounding said electrical inductive apparatus;

an infusible, thermal conductive mixture filling the space between said case and said electrical inductive apparatus;

said thermal conductive mixture comprised of at least first and second inert, inorganic, particulate materials cohesively joined by a binder material; the average size of said particles of said first material being substantially larger than the average size of said particles of said second material;

said binder material coating said particles of said second material only, so as to cohesively join said particles of said second material to contiguous particles of said first and second materials only at their points of contact such that interstices are formed between the non-contacting portions of said particles of said first and second materials.

4,082,917

SPACER FOR AERIAL CABLES

William Louis Hendrix, Amherst, N.H., assignor to Hendrix Wire & Cable Corporation, Milford, N.H.

Filed Jul. 27, 1977, Ser. No. 819,367
Int. Cl.[2] H02G *7/12;* H01B *17/16;* F16G *11/00*
U.S. Cl. 174—146 12 Claims

1. In a spacer for aerial cables comprising,

a body,

at least one generally concave seat on said body, said seat being adapted to receive a conductor cable,

first generally arcuate ratchet tooth means on said body located outwardly from said concave seat,

first generally arcuate retaining means adapted to engage a surface of a conductor cable positioned in said seat, and

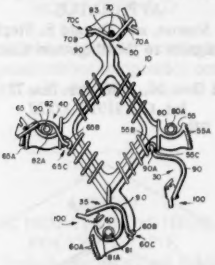
first pivot means adjacent to one end of said retaining means for maintaining a pivotal connection between said one end of the retaining means and said body, said pivot means being located adjacent to the side of said seat which is opposite to said first ratchet tooth means,

the improvement comprising,

toggle means comprising second ratchet tooth means on

one surface thereof and third ratchet tooth means which is generally arcuate and extends from one end of said second ratchet tooth means, and

second pivot means adjacent to the other end of said retaining means for maintaining a pivotal connection between said other end of the retaining means and said toggle means,



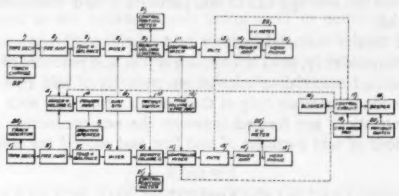
whereby upon rotation of said toggle means about said second pivot means in one direction, the teeth of said third ratchet tooth means first engage some of the teeth of said first ratchet tooth means and then the teeth of the second ratchet tooth means engage other teeth of said first ratchet tooth means and thereby said second ratchet tooth means is adapted to hold a conductor cable in said concave seat.

4,082,918

AUDIO ANALGESIC UNIT

Roland Wan-chan Chang, 17700 NW. 12 Ave., Miami, Fla. 33169, and Charles A. Graves, 251 E. Park Ave., Lake Wales, Fla. 33853

Filed Jan. 21, 1977, Ser. No. 760,838
Int. Cl.[2] A61B *19/00*; A61N *1/00*
U.S. Cl. 179—1 AA **2 Claims**



1. Apparatus for relaxing a patient while being treated comprising:

a housing unit with an internal electronic circuit means and means to connect the circuit means to a source to energize it,

first music signal means to generate a sound and including amplifier means,

a first speaker for the dentist, said first speaker being connected to the first music signal means and said amplifier means,

a set of earphones, each including speaker means to be worn by the patient and including means to connect to the first signal means and amplifier means,

control means for the first speaker for the dentist to control the volume of the first speaker,

hand-held control means for the patient to control the volume of the speaker means of the headset,

a first beeper means on the unit,

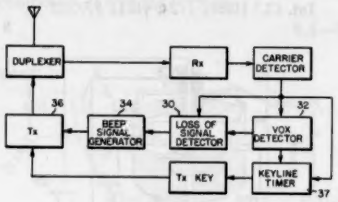
said apparatus also including switch means in series with the speaker means of said earphones to change the volume of music and signal to the earphones and to cause a signal from the beeper to indicate mode change.

4,082,919

INTERCONNECT CONTROL FOR AUTOMATICALLY CONNECTING A SIMPLEX OR HALF-DUPLEX RADIO NETWORK TO A STANDARD TELEPHONE SYSTEM

Willis E. Day, Pittsford, N.Y.; Glenn S. Danford, Oklahoma City, Okla., and Kenneth C. Johnson, Beaverton, Oreg., assignors to IEC Electronics Corporation, Newark, N.Y.

Filed Oct. 27, 1976, Ser. No. 736,357
Int. Cl.[2] H04Q *7/04*
U.S. Cl. 179—2 EA **4 Claims**



1. A control circuit for effecting a connection between a telephone system of the full duplex type and a radio signalling system of the kind in which the parties to a connection cannot each send and receive simultaneously comprising:

a. means for terminating a subscriber station telephone line and for selectively and alternately placing on hook and off hook signals on the line,

b. means for receiving signals from the receiver portion and applying signals to the transmitter portion of a selected transceiver in the radio system,

c. means for applying signals received from said receiver portion to the telephone line, and for applying signals received from the telephone line to said transmitter portion,

d. a beep signal generator connected to an input of said transmitter portion for broadcasting beep signals, and

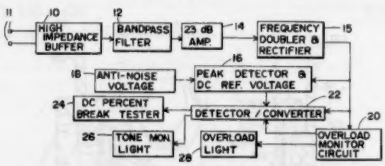
e. audio signal responsive means for activating said beep signal generator at the end of a predetermined interval following the loss of an audio signal from the telephone line.

4,082,920

TELEPHONE TESTING EQUIPMENT

Cordell V. Castleman, Bloomington, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.

Filed Jul. 9, 1976, Ser. No. 703,909
Int. Cl.[2] H04M *11/06*
U.S. Cl. 179—2 DP **12 Claims**



1. An adapter for converting AC tone bursts to DC pulses of length generally equal to the length of the tone burst comprising:

input means adapted to receive the tone bursts;

reference means operable to generate a reference voltage of about half the magnitude of the average peak voltage of the tone bursts;

detecting means connected to said input means and said

reference means and operable to detect when the voltage of said tone bursts exceeds said reference voltage; and

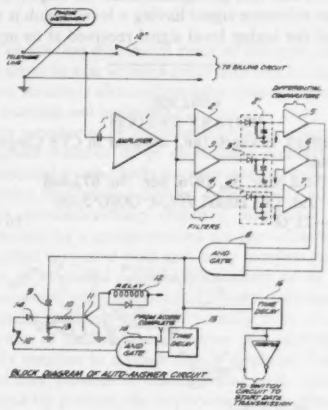
DC output switching means connected to said detecting means and operable in response to said detecting means to break said DC output substantially from the time when the tone burst first exceeds said reference voltage to the time when the tone burst last falls below said reference voltage.

4,082,921

AUTOMATIC SUBSCRIBER INTERROGATION SYSTEM

Marc Chomet, East Northport, N.Y., assignor to Teleglobe Pay-TV System, Inc., Rego Park, N.Y.

Filed Apr. 14, 1977, Ser. No. 787,363
Int. Cl.[2] H04M *11/00*; H04Q *9/12*
U.S. Cl. 179—2 A **7 Claims**



BLOCK DIAGRAM OF AUTO-ANSWER CIRCUIT

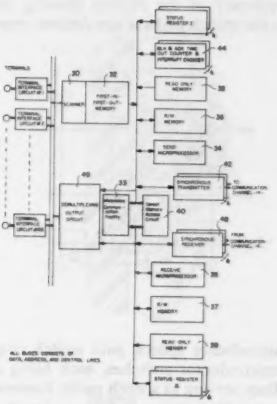
1. Interrogation system for automatically connecting and disconnecting subscriber equipment from a terminal of a communications network, comprising, in combination, central computer means at a sending location; transmitter means connected to said central computer means for sending a plurality of identification signals together identifying said equipment through said communications network to said terminal; at said terminal: connect signal furnishing means permanently connected to said terminal for furnishing a connect pulse only in response to reception of all of said identification signals; connection means having a first pair of contacts for connecting said subscriber equipment to said communications network when closed, a second pair of contacts, and control means for maintaining said first and second pair of contacts in a closed or open state when, respectively, energized or deenergized; means for connecting said control means to said connect signal furnishing means for energization by said connect pulse; time delay means connected to said connect signal furnishing means and said subscriber equipment, for furnishing a "data transmit" signal to said subscriber equipment a predetermined time interval following receipt of said connect signal, thereby initiating data transmission from said subscriber equipment to said central computer means; wherein said subscriber equipment is adapted to furnish an "access complete" signal when said data transmission has been completed; and further comprising holding circuit means connected to said control means through said second pair of contacts and connected to said subscriber equipment, for maintaining the energization of said control means following the end of said connect pulse and discontinuing said energization upon receipt of said "access complete" signal.

4,082,922

STATISTICAL MULTIPLEXING SYSTEM FOR COMPUTER COMMUNICATIONS

Wesley W. Chu, 16794 Charmel La., Pacific Palisades, Calif. 90272

Filed Feb. 22, 1977, Ser. No. 770,672
Int. Cl.[2] H04J *6/00*
U.S. Cl. 179—15 BA **16 Claims**



1. An asynchronous time division statistical multiplexing system for transmitting user messages from a plurality of terminals to at least one remote point over at least one common communication channel, said system including buffer means, scanning means for selectively introducing messages from the terminals to the buffer means, said buffer means including a first memory means which receives and stores the messages from the individual terminals and which appends an origin address to each of the messages to form corresponding addressed data characters, and in which said buffer means includes a second memory means which receives the addressed data characters from the first memory and forms the addressed data characters into data blocks; transmitter means coupled to the second memory means for transmitting the data blocks from the second memory means over the common communication channel to the remote point; a send microprocessor means connected to said first and second memory means and to said transmitter means for causing the second memory means to form the addressed data characters from a common terminal into sub-blocks, to cause each of the sub-blocks to be formed into a data block when the sub-block reaches a prescribed maximum size, and for controlling the flow of signals between said terminals, said buffer means and said transmitter means; receiver means coupled to the common communication channel for receiving data blocks from the remote point over the common communication channel for distribution to the terminals; a demultiplexing output circuit interposed between the receiver means and the terminals; and a receive microprocessor means connected to said receiver means and to said demultiplexing output circuit for controlling the flow of signals between said receiver means, said demultiplexing output circuit and said terminals.

4,082,923

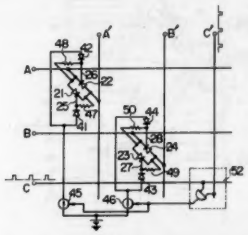
SEMICONDUCTOR SPEECH PATH SWITCH

Shinzi Okuhara, Fujisawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 22, 1974, Ser. No. 517,003
Claims priority, application Japan, Oct. 27, 1973, 48-120414
Int. Cl.[2] H04Q *3/52*
U.S. Cl. 179—18 GF **17 Claims**

1. A semiconductor speech path switch comprising semiconductor switches of gate control type having gate terminals,

each being connected between two lines serving as speech paths; constant-current regulated power supplies having high impedances and connected with said gate terminals of said semiconductor switches; and selecting circuits to render said constant-current regulated power supplies on and off, said selecting circuits controlling said constant-current regulated power supplies to intermittently render said constant-current regulated power supplies on and off at a repetition rate higher than the frequency of the current flowing through speech paths so that the speech paths at any desired cross-point may be closed.



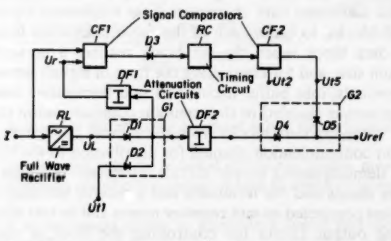
7. A semiconductor speech path switch comprising light-sensitive semiconductor switches, each being connected between two lines serving as speech paths; luminescent elements disposed near said switches; memory circuits to keep said luminescent elements in their on or off states; and selecting circuits to set and reset said memory circuits, wherein said luminescent elements are rendered on and off by setting and resetting said memory circuits so that the speech paths at any desired cross-point may be closed and opened.

4,082,924

REFERENCE SIGNAL CIRCUIT IN A RECEIVER FOR DETECTING TWO FREQUENCIES IN A MULTIFREQUENCY TONE SIGNAL

Bengt Roland Carlqvist, Stockholm, and Anders Gunnar Eriksson, Johanneshov, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 30, 1976, Ser. No. 755,826
Claims priority, application Sweden, Feb. 9, 1976, 7601387
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF **4 Claims**



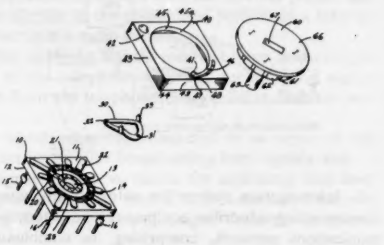
1. A reference signal circuit in a MFC-signalling receiver for the detection of two voice frequencies in a tone signal independent of short duration disturbing signals, the receiver including a number of parallel signal paths equal to the number of possible voice frequencies in the incoming tone signal, each signal path consisting of a bandpass filter, a rectifier device and an analogue signal comparator for comparison of the signal obtained from the rectifier device with a reference signal, said reference signal circuit comprising: input means for receiving the incoming tone signal; a first signal path, said first signal path including a full wave rectifier means having an input connected to said input means and an output, a first source of a first threshold voltage, a first gating means having a first input connected to the output of said full wave rectifier means, a second input connected to said first source and an output for producing a first intermediate reference signal in dependence on the amplitude of the incoming tone signal; a second signal path, said second signal path having a timing comparator means having a first input connected to said input means, a second input connected to the output of said first gating means and an output for generating a second intermediate reference signal in dependence on the duration of the incoming tone signal and the amplitude of the first intermediate reference signal, a second source of a second threshold voltage, an amplitude comparator means having a first input connected to said second source, a second input connected to the output of said timing comparator means and an output for emitting a signal which switches from a high level which is greater than the greatest level of the incoming signal to low level when the level of the signal from said timing comparator means exceeds the level of the second intermediate reference signal; and second gating means having a first input connected to the output of said amplitude comparator means, a second input connected to the output of said first gating means and an output for emitting an output reference signal having a level which is related to the level of the higher level signal received at its inputs.

4,082,925

ROTARY SWITCH

James N. Hufford, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Mar. 31, 1976, Ser. No. 672,468
Int. Cl.[2] H01H *19/54*; G05G *5/00*
U.S. Cl. 200—11 G **16 Claims**

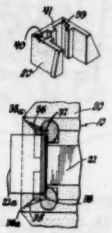


1. A rotary switch comprising a housing defining a cavity, the housing comprising a resilient side wall, an electrically nonconducting base having a first surface and a second surface and secured to the housing, a plurality of spaced contacts disposed on the first surface at predetermined angular positions, the base being provided with a plurality of terminal apertures communicating from the first surface to the second surface, a plurality of pins secured in the apertures, a plurality of conductors disposed on the first surface and electrically connecting the contacts to the pins for connection to an external circuit, a nonconducting glass film adheringly disposed on the first surface and interposed between the spaced contacts, the base provided with a centrally disposed aperture, a rotor provided with a shaft, the shaft being received in the centrally disposed aperture and rotatably secured to the base, a contactor constrained to rotate with the rotor and wipably engaging the contacts, a cam disposed on the rotor, the cam being provided with a plurality of spaced indentations about the periphery of the rotor, and an arm integral with the housing, one end of the arm being secured to the housing and the other end of the arm engageable with the rotor and receivable in the indentations, the other end of the arm being disposed between the cam and the resilient wall and movable between the rotor and the resilient side wall whereby upon rotation of the rotor the other end of the arm engaged by the cam tensilely strains the resilient portion of the side wall of the housing.

4,082,926
IGNITION DISTRIBUTOR ROTOR WITH CORONA GENERATING POINTS OF ELECTRICALLY CONDUCTIVE PAINT

Stephen W. Marks, and Robert E. Marsh, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 29, 1976, Ser. No. 709,786
Int. Cl.[2] H01H *19/10;* F02P *1/00*
U.S. Cl. 200—19 DR 4 Claims



1. In an ignition distributor rotor of the type adapted to be rotated about its axis within a distributor cap having a plurality of output terminals circumferentially disposed about the rotor axis of rotation and including

a body member of an electrical insulating material;

a segment member of an electrically conductive material supported by said body member and having an output tip portion that traces a circular path radially inwardly from said circumferentially disposed distributor cap output terminals by a predetermined arc gap while said segment member is rotated with said body member and

a pair of electrical conductor members of an electrically conductive paint in electrical contact with said body and segment members radially inwardly from said output tip portion of said segment member and supported by said body member in a plane axially displaced from and substantially parallel to said circular path traced by said output tip portion, the improvement comprising:

respective depressions in said body member that are filled by said electrically conductive paint, are shaped to form the said electrically conductive paint contained therein into respective sharp terminating points, are so positioned that the said electrically conductive paint contained therein extends outwardly toward said output tip portion and are so oriented that said sharp terminating points define a pair of circumferentially displaced sharp corona generating points in bracketing relationship with said output tip portion.

4,082,927
ELECTRICAL MAGNETIC SWITCH ADAPTABLE FOR USE IN DIGITAL WRISTWATCHES

John R. Beckwith, 480 Lassen St., Los Altos, Calif. 94022

Filed Sep. 22, 1976, Ser. No. 725,386
Int. Cl.[2] H01H *35/14;* G04B *19/30;* G04C *23/10*
U.S. Cl. 200—52 R 22 Claims

1. An electrical magnetic switch comprising:

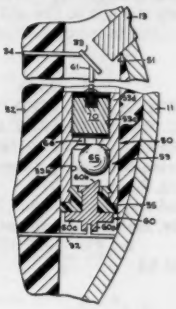
(a) a first fixed electrical contact formed with a first and second bore therein disposed in longitudinally spaced relation;

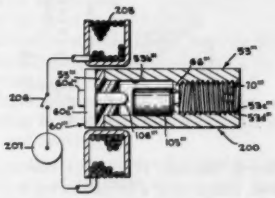
(b) a second fixed electrical contact disposed adjacent to one end of said bore of said first fixed contact with a portion thereof extending into said bore;

(c) insulating means interposed between said second fixed contact and said first fixed contact;

(d) a movable armature disposed in said first bore for movement between a first position spaced from said portion of said second fixed contact and a second position in contact with both said portion of said second fixed contact and said first fixed contact to establish an electrical connection therebetween via said armature;

(e) magnetic attraction means in said second bore of said first fixed contact for providing a magnetic force with said movable armature for normally retaining said movable armature in said first position, the movement of said movable armature against the urgency of the magnetic force into engagement with said portion of said second fixed





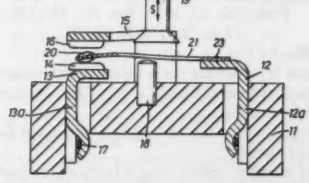
contact and said first fixed contact establishes an electrical connection therebetween via said armature; and

(f) means interengaging said first fixed contact and said magnetic attraction means for adjustably positioning said magnetic attraction means in said second bore relative to the path of travel of said movable armature for regulating the magnetic forces between said magnetic attraction means and said movable armature.

4,082,928
ELECTIC SNAP SWITCH, PARTICULARLY MINIATURE SWITCH

Jens Nicolai Andresen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Mar. 23, 1976, Ser. No. 669,670
Claims priority, application Germany, Mar. 25, 1975, 2513011
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—67 DA 3 Claims



1. An electric snap switch unit comprising housing means and abutment means attached thereto, a knife edge bearing formed on said abutment means, a pair of spaced apart fixed contacts attached to said abutment means, a three- dimensional

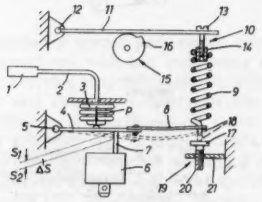
bowed snap action element formed as a generally G-shaped sheet metal strip of a spring material having a midportion extending between said fixed contacts, a movable contact attached to said strip midportion for alternate engagement with said fixed contacts, one end of said strip being fixedly attached to said abutment means and the other end of said strip being pivotally mounted in said knife edge bearing, said strip having a spring arm extending radially inwardly from said other end of said strip for creating a storage spring, and actuating means extending and being movable transversally of said strip for engaging said arm to flex said strip and thereby move said movable contact in the opposite direction.

4,082,929

ELECTRIC SWITCH ACTUATED IN DEPENDENCE ON PRESSURE, PARTICULARLY AN EVAPORATOR THERMOSTAT FOR REFRIGERATORS

Niels Peter Thorsen, Sonderborg, Germany, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 17, 1976, Ser. No. 715,123
Claims priority, application Germany, Aug. 12, 1975, 2535874
Int. Cl.² H01C *35/32*
U.S. Cl. 200—83 SA **3 Claims**



1. An electric assembly of the type operated by a thermostatic bellows, comprising, a hinged swing arm, a microswitch having a displaceable operating element attached to said arm for movement therewith, said operating element having a first position for closing and a second position for opening the contacts of said microswitch, spring means including a main spring and a differential spring in series connected at one end to said swing arm and at the other end to adjustable anchor means, said bellows biasing said swing arm in a switch closing direction and said spring means biasing said swing arm in a switch opening direction, abutment means for arresting the movement of said differential spring at a set point when said operating element is at a corresponding point between its said closing and opening positions, first adjustment means on said abutment means for adjusting the arresting point of said differential spring to adjust said closing position of said microswitch, and second adjustment means for said anchor means to adjust the stress of said spring means to adjust said opening position of said microswitch.

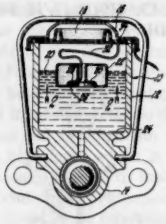
4,082,930

LIQUID LEVEL SENSOR

Denny L. Peeples, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1976, Ser. No. 660,170
Int. Cl.² H01H *35/18*
U.S. Cl. 200—84 C **3 Claims**

1. A liquid level sensor for a liquid reservoir comprising
a first member having fixedly secured thereto a magnetically actuable reed switch,
a magnet secured to the first member at a fixed distance from the reed switch,
a second member comprising a body of magnetic material normally spaced from the first member so that the magnetic field of the magnet and its influence on the reed switch is altered according to the proximity of the first and second member,
means for mounting one of the said members at a position corresponding to a certain liquid level in the reservoir, and
means for moving the other of the members according to liquid level, so that the spacing between the members varies as the liquid level changes,



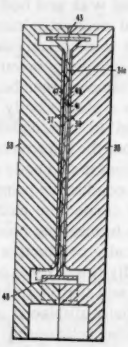
whereby the reed switch is in one state when the spacing between the members exceeds a certain amount and the reed switch is in another state when the spacing between the members is less than the certain amount so that the state of the reed switch depends on the liquid level.

4,082,931

ARC CHUTE

Matthew N. Hayes, Amherst, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 12, 1976, Ser. No. 676,181
Int. Cl.² H01H *33/08*
U.S. Cl. 200—144 C **1 Claim**



1. An arc chute comprising a heat resistant electrically insulating material comprising a melamine-formaldehyde resin, at least a portion of the surface being covered with a coating of an arc resistant ceramic material selected from the group consisting of calcium oxide and chromic oxide.

4,082,932

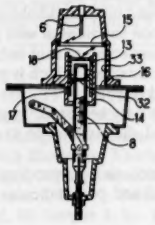
HIGH-VOLTAGE ELECTRIC EQUIPMENT CELL

Paul Rozier; Pierre Niel, both of Chalon sur Saone, and Jean Ferlay, Lyon, all of France, assignors to Delle-Alsthom S.A., Villeurbanne, France

Filed Mar. 18, 1976, Ser. No. 668,257
Claims priority, application France, Jan. 26, 1976, 76 02257; Mar. 25, 1975, 75 09323
Int. Cl.² H01H *33/88*
U.S. Cl. 200—148 R **8 Claims**

1. Electric equipment cell of the air insulated type, which comprises a switch in a dielectric fluid and crossing a wall to connect a first plug, which is live, situated on a first side of the wall to a second plug situated on the other side of the wall, the improvement wherein the switch comprises a first bell-shaped

insulator receiving the first plug and containing the contacts of the switch and a second bell-shaped insulator receiving the second plug, a metallic tank fixed on the wall and assembling said two bell-shaped insulators, the first bell-shaped insulator comprising an integral dielectric screen connected to ground



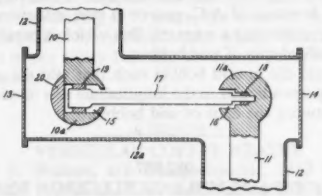
and situated between the contacts of the switch in the open position, so that in the open position of the switch, a person who is on the said other side of the wall cannot come into contact with a live part, by direct contact or by the effect of an overvoltage causing contingent spark-over in the switch.

4,082,933

STAB CONNECTOR FOR ENCLOSED ELECTRIC BUS APPARATUS

Roy Nakata, Pittsfield, Mass., and Arthur Leo Bohlinger, Newtown Square, Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Mar. 22, 1976, Ser. No. 669,794
Int. Cl.[2] H01H *1/38*
U.S. Cl. 200—163 **5 Claims**



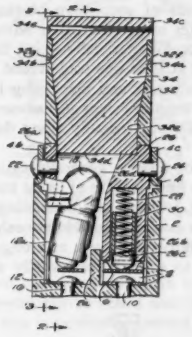
1. Enclosed electric bus apparatus comprising: a linear bus conductor having a substantially spherical terminal end provided with a through passage transverse to the axis of said linear bus conductor, fixed contact means within said passage, a second bus conductor laterally spaced from said linear bus conductor and having a contact socket in spaced apart axial alignment with one end of said transverse passage, an enclosing sheath for said bus conductors having an opening in spaced apart axial alignment with the other end of said transverse passage, a removable closure member for said sheath opening, a movable contact rod having two contact making terminal ends, one engageable with said contact socket and the other engageable with said contact means and terminating within said transverse passage when said one terminal end is in contact-making engagement with said contact socket, said rod being axially movable through said transverse passage and sheath opening to make and break electrical connection between said bus conductors, and a removable closure cap for said other end of said transverse passage forming a portion of said spherical terminal end of said linear bus conductor while said contact rod has one terminal end in contact-making engagement with said contact socket.

4,082,934

SWITCH WITH ILLUMINATED HANDLE TIP

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jun. 17, 1976, Ser. No. 697,232
Int. Cl.[2] H01H *9/16*
U.S. Cl. 200—315 **8 Claims**



1. An electric switch comprising:
a housing having an opening;
contact means mounted in said housing;
an actuator pivotally mounted to said housing at said opening and extending internally of said housing for actuating said contact means;
a stationary light source mounted in said housing and having a light emitting surface proximate the pivotal axis of said actuator at said opening;
an operating handle rigidly mounted to said actuator at said opening and extending externally of said housing, and having an elongated tunnel formed therethrough extending from an outer tip thereof longitudinally inwardly to communicate with said light source; and
an elongated rigid light-transmissive insert extending through, complementally configured to, and mounted in said tunnel to have an externally visible outer end at said outer tip and an inner end closely facing said light emitting surface and defining an arc of substantially constant radius thereabout during pivoting of said handle and said actuator, said inner end of said insert extending inwardly beyond the inner edge of said tunnel to direct otherwise divergent light rays into said tunnel, guiding and transmitting such rays therethrough, in addition to those light rays going straight through said tunnel, thereby providing increased intensity of illumination at said outer tip of said handle.

4,082,935

APPARATUS AND METHOD FOR MAKING WHEEL RIM BLANKS AND THE LIKE

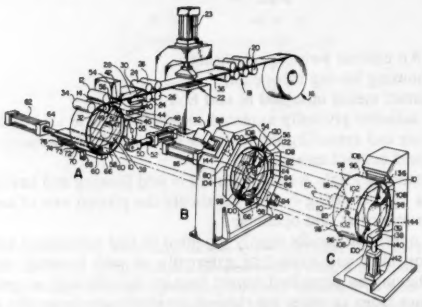
Bernard P. Lampietti, Goshen, and Erman V. Cavagnero, Torrington, both of Conn., assignors to Torin Corporation, Torrington, Conn.

Filed Jul. 19, 1976, Ser. No. 706,831
Int. Cl.[2] B21H *1/10*; B21K *1/38*; B23K *31/06, 13/02*
U.S. Cl. 219—9.5 **40 Claims**

32. Apparatus for making generally cylindrical wheel rim blanks and the like from lengths of linear stock, said apparatus comprising coiling, welding and machining stations arranged in spaced generally axially aligned relationship along a longitudinally extending horizontal path, an elongated mandrel with its axis arranged to extend horizontally and longitudinally along said path, stock feeding mechanism arranged successively to advance lengths of stock in a linear and transversely extending path of movement to said coiling station, at least one coiling tool at said coiling station operable to engage succes-

sively advanced lengths of stock whereby to cause the same to be coiled to a generally cylindrical configuration, transfer means engageable with coiled blanks at the coiling station and operable successively to advance the same along and about said mandrel to the welding station, at least two arcuate clamps at the welding station at least one of which is intermittently movable inwardly successively to engage blanks at the station, welding mechanism at said station operable to weld together the contiguous ends of successive blanks engaged by the clamps, said transfer means thereafter advancing the welded blanks in succession longitudinally along the mandrel to said machining station, at least one tool at said machining station for successively engaging and machining the blanks at their welded areas, said transfer means also advancing the machined blanks in succession longitudnally along the mandrel for discharge.

34. Apparatus for making generally cylindrical wheel rim blanks and the like from lengths of linear stock, said apparatus comprising coiling, welding and machining stations arranged in spaced generally axially aligned relationship along a longitudinally extending horizontal path, an elongated mandrel with its axis arranged to extend horizontally and longitudinally



along said path, stock feeding mechanism arranged successively to advance lengths of stock in a linear and transversely extending path of movement to said coiling station, at least one coiling tool at said coiling station operable to engage successively advanced lengths of stock whereby to cause the same to be coiled to generally cylindrical configuration, transfer means engageable with coiled blanks at the coiling station and operable successively to advance the same along and about said mandrel to the welding station, at least two arcuate clamps at the welding station at least one of which is intermittently movable inwardly successively to engage blanks at the station, high frequency current penetration welding mechanism at said station comprising a proximity conductor and an associated conductor means and power source operable to weld together the contiguous ends of successive blanks engaged by the clamps, said transfer means thereafter advancing the welded blanks in succession longitudinally along the mandrel to said machining station, at least one tool at said machining station for successively engaging and machining the blanks at their welded areas, said transfer means also advancing the machined blanks in succession longitudinally along the mandrel for discharge.

4,082,936
DEVICE AND METHOD FOR HEATING DIE

Sethuo Aoki, Noda, and Yoshiaki Sogo, Kawasaki, both of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 22, 1976, Ser. No. 698,637
Claims priority, application Japan, Jun. 24, 1975, 50-77883
Int. Cl.[2] H05B *9/02*
U.S. Cl. 219—10.41 **8 Claims**

1. Apparatus for rapid and uniform pre-heating of a die used for hot extrusion of aluminum alloys, said die having a cylindrical shape with a flat surface and a radial surface, which has a radius which is greater than its thickness and having its extrusion axis along the longitudinal center of said cylinder, comprising:

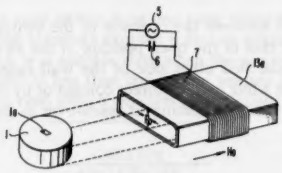
a hollow rectangular bobbin having a longitudinal axis, wherein the short side of said rectangular bobbin is less than the diameter of said die and the long side is greater than the diameter of said die;

an induction coil wound upon said bobbin around said longitudinal axis and upon the sides of said rectangular bobbin;

a source of power connected to said induction coil for producing a magnetic flux field which is parallel to the longitudinal axis of said bobbin;

whereby said die can only be placed in said bobbin with the flat surface of said die parallel to the long side of said bobbin; and

whereby said extrusion axis is perpendicular to the longitudinal axis of said coil and perpendicular to said flux field.



5. A method of uniform pre-heating of a die which is used for hot extrusion of aluminum alloys, said die having a cylindrical shape with a flat surface and a radial surface, which has a radius which is greater than its thickness and has an extrusion axis along the longitudinal center of said cylinder, comprising the steps of:

winding an induction heating coil around the longitudinal axis of a rectangular bobbin and upon the sides of said rectangular bobbin, wherein the short side of said rectangular bobbin is less than the diameter of said die and the long side is greater than the diameter of said die;

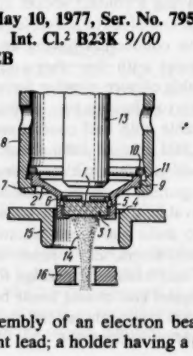
applying a source of A.C. power to said induction heating coil for producing a magnetic flux which is parallel to the longitudinal axis of said bobbin;

placing said die in said bobbin such that said die extrusion axis is perpendicular to the longitudinal axis of said bobbin and between the ends of said bobbin.

4,082,937
CATHODE ASSEMBLY OF ELECTRON BEAM WELDING GUN

Evgeny Ivanovich Istomin, ulitsa Oktyabrskoi revoljutsii, 22/7, kv. 20; Alexandr Fedorovich Ivanenko, ulitsa Zodchikh, 62, kv. 339; Leonid Pavlovich Strekal, ulitsa Gorkogo, 138, kv. 8; Adolf Alfonsovich Vasiliev, ulitsa Erevanskaya, 8a, kv. 36, and Boris Denisovich Vaskin, Andreevsky spusk, 2, kv. 26, all of Kiev, U.S.S.R.

Filed May 10, 1977, Ser. No. 795,503
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 EB **1 Claim**



1. A cathode assembly of an electron beam welding gun, comprising: a current lead; a holder having a sleeve secured in

said current lead; a disc cathode secured in said holder's sleeve; a heating cathode arranged in said current lead, coaxially therewith; said sleeve of said holder having a central orifice in its bottom, whereon there is placed said disc cathode; a cone-shaped recess provided on the internal surface of said sleeve, on the side opposite to the disc cathode, said recess widening towards said disc cathode; a split ring of a refractory material, received in said cone-shaped recess and pressing said disc cathode to said bottom of said holder's sleeve.

4,082,938

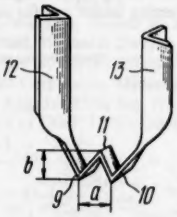
THERMIONIC HEATER CATHODE ASSEMBLY OF ELECTRON-BEAM GUN

Igor Vladimirovich Shergov, Festivalnaya ulitsa, 75, kv. 108; Vladimir Danilovich Slavinsky, Kharkovskaya ulitsa, 1, korpus 4, kv. 767; Lev Moiseevich Fridlender, Volgogradsky prospekt, 157, korpus 2, kv. 37; Valery Ivanovich Zharinov, Vrachebny proezd, 10, korpus 1, kv. 175, and Arkady Filippovich Kozhaev, ulitsa 26 Bakinskikh komissarov, 18, korpus 6, kv. 28, all of Moscow, U.S.S.R.

Filed May 10, 1977, Ser. No. 795,507

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 EB **1 Claim**



1. A thermionic heater cathode assembly of an electron-beam gun comprising: a disc cathode made of a highly-emissive material; a metal ribbon filament of the cathode, with a thermionic portion disposed near said disc cathode; said thermionic portion having a W shape, the distance between two apices being 0,6 to 0,8 of the diameter of said disc cathode and the depth of the valley between the apices being 0,5 to 0,6 of said diameter.

4,082,939

VEHICULAR COFFEE HEATER

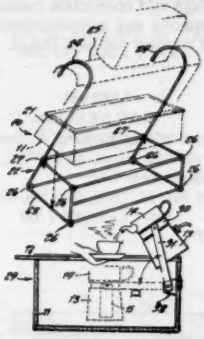
Adolbert F. Walters, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007, and George Spector, New York, N.Y., assignors to Adolbert Fitzgerald Walters, Brooklyn, N.Y.

Filed Oct. 22, 1974, Ser. No. 516,972

Int. Cl.[2] H05B *1/02;* **A47C** *7/62;* **A47F** *5/08*

U.S. Cl. 219—202 **2 Claims**

1. The combination of a vehicular coffee heater, carrying case and a wire basket rack for supporting the case on a seat back rest, wherein the rack comprises a collapsible basket and integral spaced rear members forming part of and extending from the rear side of the basket, said members extending upwardly vertically inclined to upper ends having hooks thereat for engaging to the top of the backrest, said members being pivotally connected at their lower end to the bottom and sides of the basket, said basket being formed of hinged wires whereby the wires are pivotable to a flat collapsed position, in combination with a case having an inclined rear wall conforming to the inclination of the said members, said case being dimensioned to fit snugly within the basket when said basket is open, in further combination with an electrically heated coffee vessel adapted to fit in said case, including a bracket on said vessel and a laterally sliding cover mounted over a top opening in said case to close said opening and provide access to said case and vessel including an arm pivotally secured to the bracket at one end and to the case at the other end, for pivoting movement of the arm from a horizontal position in the case to vertically upward position wherein a portion of said arm and the attached bracket extends out of said case, whereby the



vessel is within said case when said arm is in the horizontal position and the vessel can be raised outside of said case for pouring when the arm is vertically upward.

4,082,940

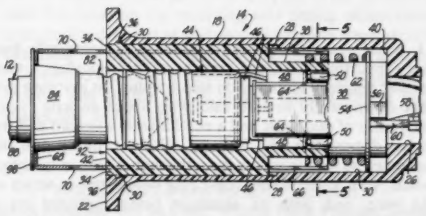
SOLDERING IRON WITH REPLACEABLE HEATING ELEMENT AND A GROUNDED HANDLE AND COMPONENTS THEREOF

Alvis R. Knowles, Carson, and Harold S. Foster, Huntington Beach, both of Calif., assignors to Eldon Industries, Inc., Hawthorne, Calif.

Filed Mar. 11, 1976, Ser. No. 666,062

Int. Cl.[2] B23K *3/02;* **H01R** *3/02;* **H05B** *1/00*

U.S. Cl. 219—239 **14 Claims**



1. In the combination of first and second parts, cooperating connection means located on said parts for establishing an electrical connection through said parts by twisting said parts relative to one another about an axis and for detachably mounting said parts together and cooperating grounding means located on said parts for establishing a ground connection between said parts, the improvement which comprises:

said grounding means on said first part comprising a metal flange located in a plane perpendicular to said axis around said axis so as to extend outwardly from and around said first part adjacent to said connection means on said first part,

said grounding means on said second part including an electrically conductive member mounted on said second part so as to extend therefrom adjacent to said connection means on said second part and so as to be capable of being moved parallel to said axis relative to said second part and also including spring means on said second part resiliently engaging said member and biasing said member outwardly away from said second part,

said connection means on said parts are adapted to be twisted together so as to establish an electrical connection and so as to mount said parts together,

said member serving to establish a ground connection with

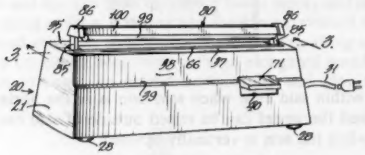
said flange through physical engagement with said flange when said parts are secured through said connection means, said member engaging said flange as said parts are secured through said connection means and twisted so as to tend to remove any accumulations of material from between said member and said flange.

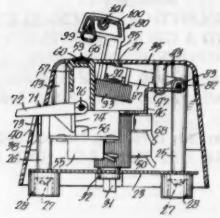
4,082,941

BAG SEALER

Daniel L. Sukow, Grafton; Richard A. Smith, and James B. Cockroft, both of Wauwatosa, all of Wis., assignors to Oster Corporation, Milwaukee, Wis.

Filed Jul. 13, 1976, Ser. No. 704,901
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—243 **6 Claims**





1. A bag sealer comprising a housing, an electrically heated wire supported on a fixed portion of said housing, a sealing member hingedly mounted on said housing for pivoting movement downwardly toward said wire about an axis disposed rearwardly of said wire, and a combination solenoid and transformer disposed in said housing with a primary coil being connected to a source of power through a manually actuated switch, with a secondary coil being connected in series with said wire, and with an armature being mounted on said hingedly mounted sealing member in spaced alignment with said coils, whereupon actuation of said switch, when unsealed edges of a plastic bag to be sealed are supported along said wire, causes (1) downward movement of said armature toward said coils and accompanying downward movement of said sealing member into sealing engagement with said bag edges and (2) the passage of current through said wire, heating same sufficiently to effect sealing of said bag edges.

4,082,942

PROCESS CONTROL SYSTEM WITH SIGNAL CONVERSION TO STANDARD INTERMEDIATE SIGNALS CARRYING DATA AS A FUNCTION OF TIME DURATION

Osamu Tada; Mutsuaki Nakagawa; Hiroshi Mori; Yutaka Wakasa; Koju Kataoka; Tadanari Inoue, and Hisayuki Uchiike, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Continuation of Ser. No. 618,268, Sep. 30, 1975, abandoned. This application Jul. 1, 1977, Ser. No. 812,060
Int. Cl.[2] H03K *13/20*; G05D *27/02*
U.S. Cl. 364—111 **1 Claim**

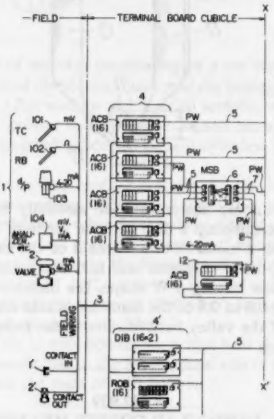
1. In a process control system arranged to accept varied forms of analog sensing signals from a plurality of field sensing devices, to process data represented thereby both digitally and in analog fashion, and to supply varied forms of analog control signals to a plurality of analog field control devices, the improvement which comprises:

an input signal converter means for each field sensing device for converting data from (a) the varied analog forms generated by the field sensing devices to (b) first input intermediate signals in a standard form arranged to carry data as a function of time duration;

isolator means for each of said input signal converter means and having an input and an output section; means for directing the first input intermediate signal developed by each input signal converter to a respective input section, the associated output section being arranged to provide a second input intermediate signal corresponding directly to the first input intermediate signal fed to said input section but conductively isolated therefrom;

an input digital interface and storage means for each field sensing device for converting data from (a) the corresponding second input intermediate signal to (b) input digital signals in a form for use by digital data processing means, and for storing the input digital signals for use on demand by the data processing means;

an output digital interface and storage means for each field control device for storing output digital signals supplied by the data processing means and for converting the out-



put digital signals into first output intermediate signals in a standard form arranged to carry data as a function of time duration;

analog data processing means; means for converting data derived from said second input intermediate signals into input analog signals for use by said analog processing means; means for converting output analog signals from said analog data processing means into an additional set of said first output intermediate signals;

isolator means for each of said output signal converter means and having an input section and an output section; means for directing the first output intermediate signals to respective input sections of said isolator means, the output section of each isolator means being arranged to provide a second output intermediate signal corresponding directly to the intermediate signal fed to the input section thereof but conductively isolated therefrom;

conductively-isolated power supply means supplying power to (1) said input sections of said isolator means for said input signal converter means and (2) said output sections of said isolator means for said output signal converter means;

an output signal converting means for each field control device for converting said second output intermediate

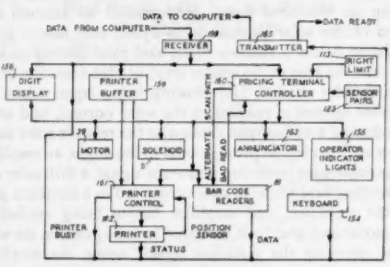
signals into the varied forms of output analog control signals required by the field control devices; and

signal path editing means comprising a plurality of separate input terminal means and a plurality of separate output terminal means; means interconnecting selected input terminal means to selected output terminal means to provide a preselected set of signal paths between certain of said input terminal means and certain of said output terminal means; said interconnecting means providing for ready alteration of said preselected set of signal paths to any of a number of different sets of signal paths to accommodate variation in required signal transmissions; means connecting predetermined output sections of said isolator means to corresponding ones of output terminal means; and means connecting each of said output terminal means to said input digital interface and storage means.

4,082,943
METHOD AND APPARATUS FOR READ AND PRINT DATA

Gerald A. Jensen, Wayzata; Ronald B. Harvey, Minneapolis; Patrick J. Caulfield, Wayzata; Dwayne H. Putzke, Brooklyn Center, and Gerald R. Strunc, Maple Grove, all of Minn., assignors to Pako Corporaton, Minneapolis, Minn.

Filed Aug. 13, 1976, Ser. No. 714,174
Int. Cl.[2] G06F *11/00*; G06K *1/12*
U.S. Cl. 235—303.1 **17 Claims**



1. A system for reading machine-readable information from a carrier and printing information onto the carrier, said system comprising:

guide path defining means for defining a guide path for the carrier,

motive means for moving the carrier along the guide path,

reader means disposed along the guide path for reading the machine readable information from the carrier as the carrier is moved along the guide path past the reader means and indicating whether the reading of the machine readable information was successful or unsuccessful,

storage means for storing information to be printed on the carrier depending on the machine-readable information on the carrier which is read by the reader means,

printer means disposed along the guide path for printing information from the storage means,

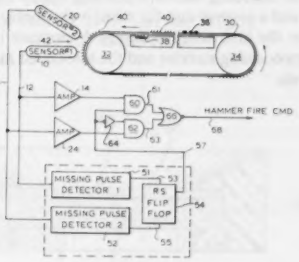
enable means for enabling the printer means to print the information from the storage means when the reader means indicates it has successfully read the machine readable information, and

read-repeat means for causing the motive means again to move the carrier along the guide path and causing the reader means to re-read the machine-readable information if the reader means indicates that a previous attempt to read the same has been unsuccessful.

4,082,944
BAND TIMING GENERATOR

Robert Snyder, Melbourne, Fla., assignor to Documation, Inc., Melbourne, Fla.

Filed Oct. 12, 1976, Ser. No. 731,652
Int. Cl.[2] G06K *15/08*
U.S. Cl. 235—309 **12 Claims**



1. A method for reading periodic timing marks from a moving printing band and for generating synchronous timing signals during the passage of a missing timing mark on the printing band, said method comprising the steps of:

(a) detecting the passage of each of said timing marks at a first location adjacent the printing band and generating a timing pulse responsive thereto;

(b) detecting the passage of each of said timing marks at a second location adjacent the printing band and generating a timing pulse responsive thereto, said second location spaced from said first location in a direction opposite the direction of motion of said timing belt;

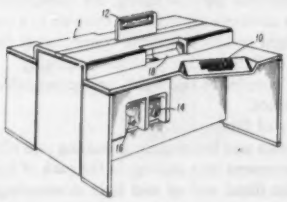
(c) detecting the passage of said missing timing mark adjacent said second location; and

(d) switching an output normally coupled to the detector at said first location for receiving said timing pulses therefrom to the detector at said second location responsive to detecting the passage of said missing timing mark adjacent said second location, whereby the output will continue to receive said timing pulses as said missing timing mark passes said first location.

4,082,945
DOCUMENT PROCESSING DEVICE

Adrianus Johannes van de Goor, Wilnis; Hans Pijlman, Nieuwveen, and Bernard Evert van der Vleugel, Harmelen, all of Netherlands, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1977, Ser. No. 799,629
Claims priority, application Netherlands, Jun. 30, 1976, 7607250
Int. Cl.[2] G06F *7/02*; G06K *3/12, 7/08*; B65H *5/22*
U.S. Cl. 235—419 **11 Claims**



1. A document processing device for performing individual operations on at least two different kinds of documents, such as bills, and associated vouchers or instructions for payment such as checks, provided with transport means for carrying documents of the first kind, the bills, continuously past at least a

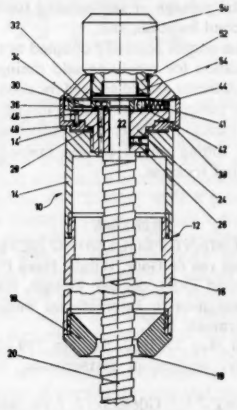
reading station, and with transport means for incrementally moving documents of the second kind, the checks, past at least an encoding station, characterized in that a single transport path for at least two kinds of documents is provided, which is equipped with a single transport drive for selectively, continuously or intermittently moving documents past processing stations disposed along the transport path, such as a reading station, an encoding station, a printing station and an endorsing station, and a control unit for selectively controlling, in dependence on the alternately different documents introduced, the various processing stations and the associated movement of the documents.

4,082,946

APPARATUS FOR CONTROLLING THE ILLUMINATION OF OPTICAL EXAMINATION DEVICES

Helmut A. Heine; Otto H. Schmidt, both of Herrsching, and Helmut W. Rosenbusch, Weilheim, all of Germany, assignors to Propper Manufacturing Co., Inc., Long Island City, N.Y.

Filed Jul. 8, 1976, Ser. No. 703,573
Int. Cl.[2] F21L *1/00, 25/00*
U.S. Cl. 362—32 **5 Claims**



1. An apparatus for controlling the illumination of optical examination devices adapted to be coupled to a source of light through a light conducting cable connected at its near end to said source of light, said apparatus comprising:

a housing coupled to said light conducting cable at the distal end thereof;

a plurality of filters; and

means within said housing for mounting said filters for selective movement into and out of the path of light eminating from the distal end of said light conducting cable; positioning means mounted to said housing for movement relative thereto; and

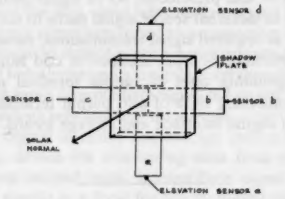
means for coupling the movement of said positioning means to said filter mounting means so that said filters can be moved in and out of said light path by moving said positioning means.

4,082,947

SOLAR COLLECTOR AND DRIVE CIRCUITRY CONTROL MEANS

George Lewis Haywood, South Rockwood, Mich., and Wesley Joseph Haywood, Harvard, Mass., assignors to The George L. Haywood Co., Flat Rock, Mich.

Filed Mar. 25, 1976, Ser. No. 670,402
Int. Cl.[2] G01J *1/20;* **H01J** *39/12*
U.S. Cl. 250—203 R **7 Claims**



1. A Solar Collector Controller comprising a solar sensor array, an electronic data processor and amplifier, a drive motor, a gear train, and means for mounting the controller on a gimbaled solar collector, said sensor array being a set of four sensors oriented in pairs at a 90° angle, each pair being oriented perpendicular to its neighbor so as to form a sensitive surface consisting of four sensor surfaces arranged to produce electrical signals, each pair of signals being summed differentially to produce an error signal having phase and amplitude proportional to the orientation of the sensor pair with respect to the incident solar flux, said sensor pairs being oriented parallel to and orthogonal to the diurnal path of the sun, said orientation providing an electrical signal proportional to azimuth and elevation of the solar normal in its cycle, said sensor array being placed below a shadow plate, said plate having an area smaller than the area of the sensor array so that a portion of the array is thereby shaded, said shading being equal when the sensor joint normal is parallel to the solar normal, said array then producing a null output, otherwise the relative solar angle produces an error signal proportional to the angle, an amplifier with a variable gain receiving said error signal, a fifth solar cell for controlling said variable gain connected in a feedback path across the amplifier, said amplifier output being applied to drive a motor and gear train mounted so as to position the solar collector carrying the radiation sensor array, the amplifier means arranged so as to drive the solar collector to reduce the relative solar angle to a null position for maximizing solar collector efficiency, control circuit means connected to said amplifier means for restoring the solar collector orientation to an easterly position when the solar irradiance on the sensor array falls below a pre-set threshold after sunset.

4,082,948

GENERATOR MONITORING APPARATUS

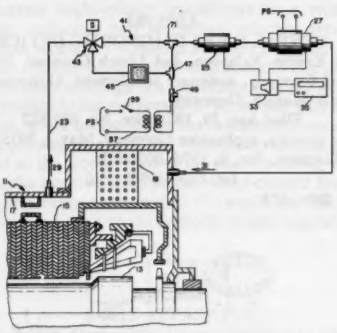
Sterling C. Barton, Scotia; Chester C. Carson, Ballston Spa, and Federico S. Echeverria, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,772
Int. Cl.[2] G01N *31/00;* **G01T** *1/18*
U.S. Cl. 250—304 **6 Claims**

1. A monitoring system for a gas cooled dynamoelectric machine of the type having parts therein coated with selected materials which will decompose into submicron pyrolysate particles at elevated temperatures to become entrained in the machine gas coolant; the monitoring system connectable to the dynamoelectric machine for withdrawing a sample of the machine gas coolant and comprising:

a first detector apparatus consisting of an ion chamber detector at ambient temperature receiving at least a portion of said machine gas sample and providing a first output signal based upon the conductivity of the ionized gas sample;

a second detector apparatus consisting of a heated ion chamber detector receiving at least a portion of said machine gas sample and providing a second output signal based upon the conductivity of the ionized gas sample; and,



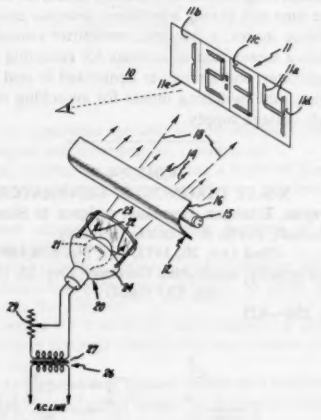
means receiving said first and second output signals, said receiving means enabling a comparison between said first and second output signals whereby the presence of pyrolysate particles may be validated.

4,082,949

VARIABLE INTENSITY FLUORESCENT DISPLAY

John E. Bigelow, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,748
Int. Cl.[2] G03B *21/00*
U.S. Cl. 250—329 **11 Claims**



1. A variable intensity fluorescent display comprising:

display means for direct viewing of indicia, said display means having at least one selectable indicia formed permanently thereon of a material fluorescing at visible wavelengths responsive to excitation by radiation of a first range of wavelengths;

first means for illuminating said at least one indicia with a substantially constant magnitude of radiation of said first wavelength range to establish a maximum brightness of said indicia; and

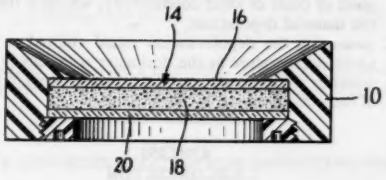
second means for illuminating said at least one indicia with an adjustably varying magnitude of radiation of a second range of wavelengths differing from said first wavelength range and selected to produce a variable quenching action in all of said indicia to variably reduce the brightness of the visible wavelength fluorescence therefrom.

4,082,950

CALIBRATION ASSEMBLY FOR INFRARED MOISTURE ANALYZER

Leighton L. Chen, Greensboro, N.C., assignor to Loew's Theatres, Inc., New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,658
Int. Cl.[2] G01D *18/00*
U.S. Cl. 250—343 **6 Claims**



1. A calibration assembly for an infrared moisture analyzer for measuring the moisture content of tobacco leaf by reflection of infrared radiation which comprises:

(a) a housing having means for mounting in the moisture analyzer;

(b) a glass window which is transparent to infrared radiation, said window being etched on both faces and secured within the housing;

(c) a layer of a particulate material contained within the housing beneath the window, said material having an average particle size in the range of about 50–100 microns;

(d) means to retain the particulate material layer within the housing; and

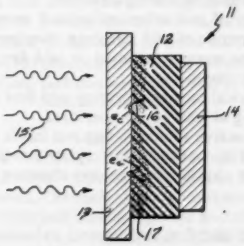
(e) said assembly having a reflectivity from the window thereof with respect to the infrared wavelengths employed in said analyzer comparable to the reflectivity of tobacco, and providing a predominantly diffuse reflection from the window.

4,082,951

COMPTON EFFECT THERMALLY ACTIVATED DEPOLARIZATION DOSIMETER

Paul R. Moran, Madison, Wis., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 23, 1975, Ser. No. 598,276
Int. Cl.[2] G01T *1/00*
U.S. Cl. 250—336 **10 Claims**



1. A Compton effect dosimetry method for high-energy gamma and X-radiation comprising:

a. forming a Compton effect dosimeter by placing a thin film of a dielectric material between a back electrode and a radiation-receiving electrode composed of a metal of such

an atomic number so as to serve as a Compton-electron radiator;

b. short-circuiting the two electrodes of the dosimeter;

c. annealing the short-circuited dosimeter;

d. exposing the short-circuited dosimeter to the radiation so that the radiation impinges on the radiation-receiving electrode, whereby the gamma or X-radiation interacts with the metal, electrons are produced by the Compton effect, the Compton effect electrons are emitted preferentially in the direction in which the radiation is traveling, a portion of the Compton effect electrons becomes trapped in the dielectric material, and consequently an electrical polarization is induced in the dielectric material;

e. subsequently heating the short-circuited dosimeter to the point of onset of ionic conductivity, whereby the dielectric material depolarizes;

f. measuring the depolarization signal emitted as current versus temperature as the dosimeter is gradually heated, whereby the integrated current is proportional to the dose of radiation received by the dosimeter.

4,082,952

ION DETECTOR

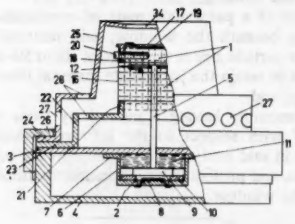
Jacques Depoitier, and Romain Vinchent, both of Wanferce-Baulet, Belgium, assignors to Institut National des Radio-elements - Nationaal Instituut voor Radio-elementen, en abrege: "I.R.E.", Brussels, Belgium

Filed Jul. 12, 1976, Ser. No. 704,601

Claims priority, application Belgium, Jul. 11, 1975, 831296

Int. Cl.[2] G01T *1/18*

U.S. Cl. 250—381 **7 Claims**



1. An ion detector comprising:

a printed circuit plate,

axially aligned conductive metal cylindrical members on opposite sides of said printed circuit plate

one of said cylindrical members forming a first measuring chamber and the other forming a second, reference chamber,

a plate closing off the end of the measuring chamber remote from said printed circuit plate and forming the first electrode of said measuring chamber,

the bottom of said other cylindrical member forming the first electrode of said reference chamber,

radio-active sources mounted to said first electrode of respective chambers,

the cylindrical member forming said first measuring chamber being at least partly apertured,

said radio-active sources being laid inside respective chambers and in contact with the plate and the bottom wall of said first chamber and second chamber cylindrical members,

a rod projecting through said printed circuit plate and coaxial with said first and second cylindrical members and terminating short of said plate closing off said first chamber cylindrical member and the bottom of said second chamber cylindrical member,

second electrodes for said chambers mounted respectively at the ends of said rod and facing said radio-active sources respectively, and wherein the second electrode of said first chamber comprises a flat apertured portion in parallel with the plate overlying the end of said first cylindrical member remote from said printed circuit plate, and wherein said first cylindrical member plate defines a flat surface.

4,082,953

DENTAL X-RAY DIAGNOSTIC DEVICE

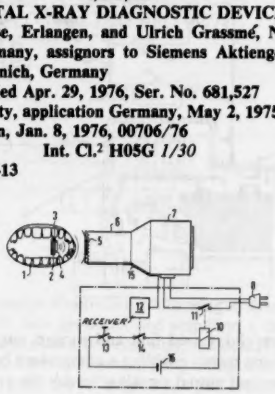
Hartmut Krause, Erlangen, and Ulrich Grassmé, Nuremberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 29, 1976, Ser. No. 681,527

Claims priority, application Germany, May 2, 1975, 2519640; United Kingdom, Jan. 8, 1976, 00706/76

Int. Cl.[2] H05G *1/30*

U.S. Cl. 250—413 **8 Claims**



1. A dental X-ray diagnostic device for preparation of X-ray film pictures comprising, in combination, X-ray radiation means with an X-ray tube and high-voltage supply therefor exterior to a patient; film holding means insertable into the mouth of the patient; means for setting the exposure time and having switching means for switching off the X-ray tube high voltage upon reaching the dosage corresponding to optimum blackening of film in said film holding means; said setting means comprising automatic exposure means for measuring the exposure time and having a radiation detector attached to said film holding means, a wireless transmitter connected to said film holding means, and an antenna for receiving signals from said transmitter, and a receiver connected to said antenna and controlling said switching means for switching off the X-ray tube high voltage supply.

4,082,954

X-RAY DIAGNOSTIC GENERATOR

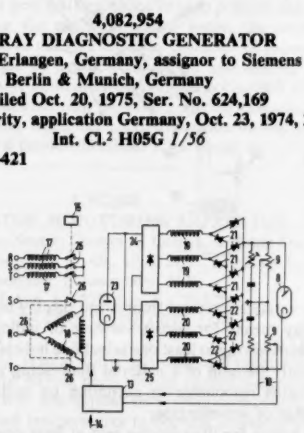
Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 20, 1975, Ser. No. 624,169

Claims priority, application Germany, Oct. 23, 1974, 2450428

Int. Cl.[2] H05G *1/56*

U.S. Cl. 250—421 **1 Claim**



1. In an X-ray diagnostic generator including a high-voltage transformer; a high-voltage rectifier for supplying the X-ray tube of said generator being connected to the output of said high-voltage transformer; a regulating rectifier for the X-ray tube voltage being arranged in the high-voltage circuit; a comparator for the actual and reference values of the X-ray

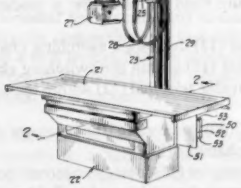
tube voltage being connected to a control electrode of said regulating rectifier; and switch means for the automatic determination of the starting time for the X-ray tube, the improvement comprising: said switch means being located in the primary circuit of said high-voltage transformer; Polyphase alternating current high-voltage transformer in a twelve-pulse connection including two secondary winding groups each having three secondary windings and two polyphase alternating current rectifier bridges each connected to one of the ends of the secondary windings of a secondary winding group, both rectifier bridges being connected in series and supplying said X-ray tube; and a further polyphase alternating current rectifier being provided for each said secondary winding group and connected to the second ends of the corresponding secondary windings, the positive poles of the direct-current branches of said rectifiers being connected to the anode and the negative poles being connected to the cathode of said regulating rectifier.

4,082,955

X-RAY APPARATUS

Leslie James Sell, Orangeville, Canada, assignor to Picker Corporation, Cleveland, Ohio

Filed Aug. 11, 1975, Ser. No. 603,264
Int. Cl.² G03B *41/16*
U.S. Cl. 250—445 T **35 Claims**



1. An X-ray apparatus operable selectively and one at a time for radiography and tomography, comprising:

a. an X-ray source device providing a beam of X-radiation;

b. an X-ray imaging device responsive to incident X-radiation;

c. a patient support for positioning portions of a patient between said devices;

d. structure extending between and mounting said devices for independent movement relative to each other and relative to the support;

e. drive means for selectively interconnecting and driving said devices through coordinated movements for tomography; and,

f. the drive means being housed within and shielded by the structure and including means for automatic interconnection.

4,082,956

X-RAY FILM CHANGER FOR SERIAL RADIOGRAPHY

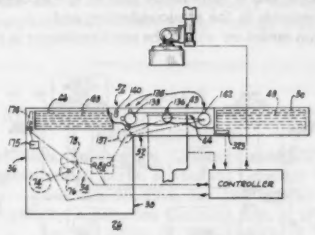
Tamas A. Vepy, Mississauga, Canada, assignor to Picker Corporation, Cleveland, Ohio

Filed Sep. 26, 1975, Ser. No. 617,102
Int. Cl.² G03D *13/08, 13/10*
U.S. Cl. 250—480 **22 Claims**

1. In a radiographic system for exposing X-ray film, the combination comprising:

a. a film pack including a pouch, at least one intensifying screen and a sheet of X-ray film disposed in the pouch, the pouch having an opening through which the sheet may be inserted and removed; and

b. force-applying means including mechanism for engaging the pouch to force the screen into surface engagement with the sheet and to clamp portions of the pouch near the



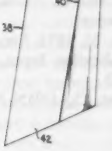
opening to provide a releasable, largely airtight contact, the contact continuing during X-ray exposure of the sheet.

4,082,957

X-RAY ABSORBING WEDGE FOR IMPROVING SOFT TISSUE OUTLINE

Alva F. Morlan, 8044 Pawnee, Prairie Village, Kans. 66208

Filed Apr. 29, 1976, Ser. No. 681,556
Int. Cl.² G03B *11/00*
U.S. Cl. 250—482 **15 Claims**



1. An X-ray cassette for use in dental and medical X-ray equipment, said cassette comprising:

a film-receiving compartment,

a thin, plate-like member of X-ray absoring material, and

means mounting said member in ray-filtering relationship to X-ray radiation incident on a portion of a film in said compartment,

said member extending partially across the cassette to a featheredge of the member beyond which the radiation will be unfiltered, said featheredge being sufficiently thin to prevent a visible line of demarcation from appearing between the filtered and unfiltered areas of a resulting radiograph, and said member being tapered toward said featheredge to present absorptive material of progressively increased thickness away from said featheredge to thereby provide progressively increased soft tissue resolution away from said featheredge in said portion of a film

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4,082,958

APPARATUS INVOLVING PULSED ELECTRON BEAM PROCESSING OF SEMICONDUCTOR DEVICES

Allen R. Kirkpatrick, Chelmsford, Mass., assignor to Simulation Physics, Inc., Bedford, Mass.

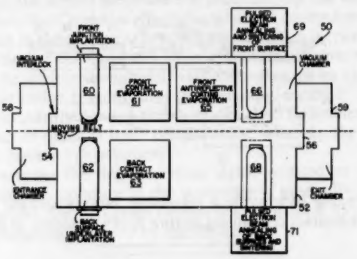
Continuation of Ser. No. 636,055, Nov. 28, 1975, abandoned.
This application Apr. 27, 1977, Ser. No. 791,499
Int. Cl.² H01J *37/30*
U.S. Cl. 250—492 B **5 Claims**

1. An apparatus for thermal processing of selected localized regions of a semiconductor, said apparatus comprising:

(a) beam generator means for generating a short duration pulsed electron beam, said electron beam having a pulse

duration in the range of 10^{-9} to 10^{-1} second, fluence in the range of 10^{-3} to 10^{2} cal/cm^2 and electron energy which is sufficiently high to permit thermal processing of the semiconductor and is sufficiently low as not to create atomic displacements in the semiconductor; and

(b) position means on which the semiconductor is supported,



said semiconductor being disposed in a path along which said electron beam propagates, said short duration pulse impacting upon the selected regions of the semiconductor and momentarily elevating the temperature of the selected regions above a temperature at which the thermal processing effects occurs for a time period of less than one second.

4,082,959

LIQUID LEVEL DETECTOR

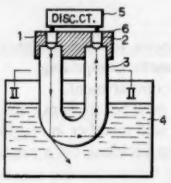
Noriyuki Nakashima, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 24, 1976, Ser. No. 699,607

Claims priority, application Japan, Jun. 27, 1975, 50-80176; Jul. 23, 1975, 50-90662

Int. Cl.² G01N *21/26*

U.S. Cl. 250—577 **6 Claims**



1. An optical detector comprising:

a U-shaped transparent glass bar having an incidence light path portion having an open end, a reflected light path portion having an open end and an intermediate bent portion connecting said incidence and reflected light path portions circularly at a predetermined detection position within a container for holding a liquid to be detected, said incidence light path portion and said reflected light path portion being separated and extending parallel to each other to allow said liquid to fill the space therebetween;

light emitting means for emitting light toward the open end of said incidence light path portion;

lens means, coupled to said incidence light path portion to deform the open end of said light path portion to be either concave or convex, for rendering the light emitted from said light emitting means to be transmitted to said intermediate bent portion through said incidence light path portion in parallel with the axis of said incidence light path portion;

light receiving means for receiving the light reflected by said intermediate bent portion and transmitted through said reflected light path portion; and

discriminating means for discriminating whether the level of said liquid has reached said predetermined position in accordance with the quantity of the reflected light received by said light receiving means at the open end of said reflected light path portion.

4,082,960

PNEUMATICALLY OPERATED PRESSURE SWITCH, PARTICULARLY FOR VEHICLE TIRE SUPERVISION

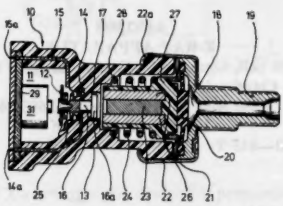
Jean Denamps, Ausnieres, and Jean LeCossec, Esbly, both of France, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 7, 1976, Ser. No. 730,634

Claims priority, application Germany, Nov. 3, 1975, 2549010

Int. Cl.² H01H *35/34*

U.S. Cl. 307—118 **13 Claims**



1. Pressure operated switch to change state when the pressure of a pressure fluid drops below a predetermined level, having

housing means (13) defining a switching chamber (11);

a fixed terminal (15) within the switching chamber (11);

a slidable, movable terminal (12) within the switching chamber (11);

a membrane (20) separating the pressure fluid from the switching chamber (11);

a permanent magnet (23) located to move upon deflection of the membrane when subjected to fluid pressure

a pair of pole shoes (26) located adjacent the permanent magnet (23);

a non-magnetic holder (27) surrounding the permanent magnet (23) and the pole shoes to transfer movement thereof to transfer movement of the holder (27) in accordance with changes in pressure of the pressure fluid to the movable terminal (12)

comprising

a first spring (24) acting on said non-magnetic holder (27) and between a shoulder in the housing means (13) to press the permanent magnet (23) and its holder (27) against the membrane (20) and to bias the permanent magnet in a direction counter the deflection of the membrane (20) when subjected to fluid pressure;

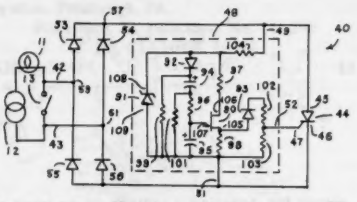
and a second spring (25) weaker than said first spring engaging the movable terminal (12) the movable terminal having an armature (16*a*) located in magnetic attractive relation to said permanent magnet;

the membrance (20) and said springs (24, 25) being dimensioned to deflect under operating pressure which is greater than said predetermined pressure and in a direction counter the force of the first spring (24) to effect attraction of the armature and hence the movable terminal and ultimate engagement thereof and holding thereof by magnetic force overcoming thereby the force of the second spring (25), and, upon drop in pressure below said predetermined level, cause separating movement of the permanent magnet (23) under force of the first spring (24) permitting the second spring (25) to snap away the movable terminal (12) and effect positive snap action of the movable terminal.

4,082,961
LIGHT SWITCH WITH DELAYED TURNOFF

Luther L. Genuit, 6231 Calle Del Paisano, Phoenix, Ariz. 85251

Filed Nov. 3, 1975, Ser. No. 627,898
Int. Cl.² H01H 7/00, 43/00
U.S. Cl. 307—141 18 Claims



1. A two-terminal delay network for connection across a mechanical switch comprising:

a switching element having first and second power electrodes and a gate electrode,

a phase-delay to zero conduction control circuit having first and second control input terminals and an output terminal,

first and second delay network terminals,

said first delay network terminal being connected to said first power electrode and to said first control input terminal,

said second delay network terminal being connected to said second power electrode and to said second control input terminal,

said output terminal being connected to said gate electrode,

means for directly connecting said first delay network input terminal to a first terminal of the mechanical switch, and

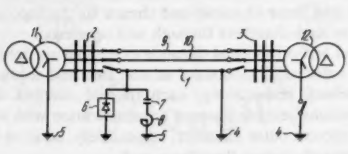
means for directly connecting said second delay network input terminal to a second terminal of the mechanical switch,

whereby the mechanical switch, while it is closed, carries the load current to a light or other load and upon the opening of the mechanical switch said control circuit supplies turn-on signals to said gate electrode during each cycle of alternating current voltage supplied to a light or other load controlled by the mechanical switch causing said switching element to be conductive and to carry current to the light or other load for a limited period of time following the opening of the mechanical switch.

4,082,962
DEVICE FOR MELTING THE ICING BY DIRECT CURRENT ON CONDUCTORS OF OVERHEAD POWER TRANSMISSION LINE

Vladimir Vladimirovich Burgsdorf, ulitsa Krasina, 19, kv. 129, Moscow; Georgy Andreevich Genrikh, ulitsa Chekistov, 10, kv. 3, Lvov; Leonid Alexeevich Nikonets, Khasanskaya ulitsa, 8, kv. 4, Lvov; Valery Vasilievich Mishin, ulitsa Suvorova, 25, kv. 42, Lvov; Viktor Yakovlevich Kuznetsov, ulitsa Popovicha, 110, kv. 20, and Anatoly Dmitrievich Kondratiev, ulitsa Mira, 182, kv. 25, both of Juzhno-Sakhalinsk, all of U.S.S.R.

Filed Jul. 11, 1977, Ser. No. 814,277
Int. Cl.² H02B 1/00
U.S. Cl. 307—147 16 Claims

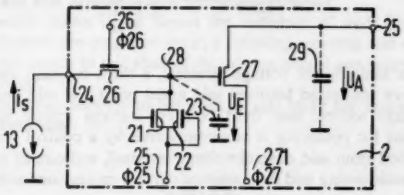


1. A device for melting icing by direct current through the conductors of an overhead power transmission line featuring transformers with grounded neutral wires connected thereto, comprising: a rectifier connected for the ice melting period by its direct-current voltage lead-out wires to at least one disconnected conductor of the power transmission line and a grounding circuit; and a commercial frequency circuit filter connected parallel to the direct-current voltage lead-outs of said rectifier.

4,082,963
REGENERATING AMPLIFIER FOR CCD ARRANGEMENTS

Kurt Hoffmann, Taufkirchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 25, 1976, Ser. No. 717,703
Claims priority, application Germany, Sep. 3, 1975, 2539205
Int. Cl.² H01L 29/78; G11C 19/28
U.S. Cl. 307—221 D 4 Claims



1. Regenerating amplifier, in particular for use in CCD registers, comprising a first and a second transistor cross-connected to one another, two source (or drain) terminals of these transistors connected to one another, and the two drain (or source) terminals of these transistors being connected to one another, the gate terminal of the first transistor being connected to the drain (or source) terminals of the two transistors, and the gate terminal of the second transistor being connected to the two source (or drain) terminals of the two transistors, a first point at which the two source (or drain) terminals are connected to one another being connected via a third transistor to the input of said regenerating amplifier, said third transistor being controllable via its gate terminal, a second point at which the drain (or source) terminals of the first two transistors are combined representing a terminal to which a pulse train can be connected to said second point, said first point being connected to the gate terminal of a fourth transistor, the source (or drain) terminal of the fourth transistor being connected to the output of said regenerating amplifier, the drain (or source) terminal of said fourth transistor being connected to a terminal to which a timing potential may be connected, said first point being connected to a capacitance, and the output being connected to a second capacitance.

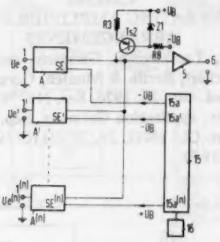
4,082,964
DIODE SWITCH

Johannes Gies, Holzkirchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 25, 1977, Ser. No. 772,098
Claims priority, application Germany, Feb. 27, 1976, 2608117
Int. Cl.² H03K 17/00
U.S. Cl. 307—259 10 Claims

1. A diode switch for the optional switch-through of an input-end signal to an output comprising a four-pole having a series arm which includes a first diode and a second diode oppositely poled to one another and a shunt arm which includes at least one diode connected to said series arm between said first and second diodes, an input impedance transformer having a relatively low output resistance ahead of said four-pole, an output impedance transformer having a relatively high input resistance connected to the output end of said second diode of said four-pole, the different switching states being determined by the conductive state of said diodes, a first con-

stant current source connected between a positive voltage source and said connection between the output end of said second diode and an output terminal, a second constant current source connected between the nodal point between said first and second diodes and a negative voltage source, a control voltage terminal, said second constant current source having means for rendering it conductive by a control voltage applied



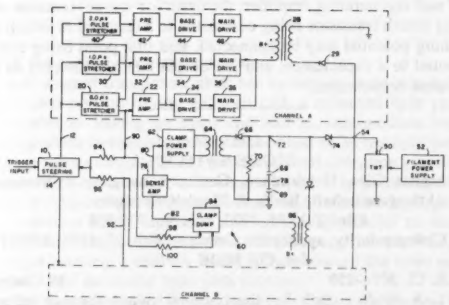
from said control voltage terminal, a third constant current source connected between said nodal point and said positive voltage source said third constant current source having means for rendering it non-conductive by a control voltage applied from said control voltage terminal, and circuit means for maintaining said first constant current means conducting at all times.

4,082,965

HIGH VOLTAGE PULSER

Donald W. Hornbeck, Pelham, N.H., and James P. O'Loughlin, Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 754,302
Int. Cl.² H03K *17/00*
U.S. Cl. 307—260 **6 Claims**



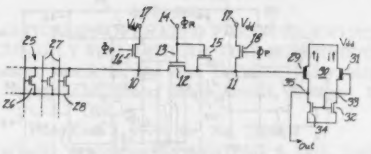
1. A high voltage pulser for cathode driving a traveling wave tube, comprising: first and second channels for driving said traveling wave tube, a pulse steering circuit for receiving high pulse repetition frequency input signals and coupling the outputs at one-half the input repetition frequency to said first and second channels alternately, and a clamp circuit coupled across said traveling wave tube for clamping excess voltage levels coupled to said traveling wave tube from said first and second channels.

4,082,966

MOS DETECTOR OR SENSING CIRCUIT

Perry W. Lou, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1976, Ser. No. 754,473
Int. Cl.² H03K *5/18, 17/60;* G11C *13/08, 17/04*
U.S. Cl. 307—362 **12 Claims**



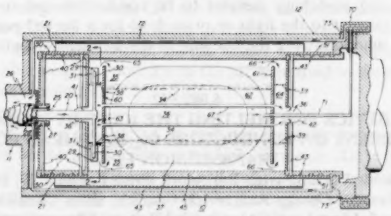
1. A circuit for detecting a voltage on an input node and providing a high level voltage change on a sense node, comprising: a transistor having a source-drain path connected in series between the input node and the sense node and having a gate; a gated capacitor separate from the inherent capacitance of the transistor connected between the gate of the transistor and the sense node, the gated capacitor switching from a very low capacitance mode to a high capacitance mode when the voltage across it exceeds a threshold value; means to apply a read clock pulse of a given voltage level to the gate of the transistor; the output on said sense node after said read clock pulse being two-valued, one value occurring when the voltage on the input node is no more than said threshold value different from said given voltage level and the other occurring when the voltage on the input node is more than said threshold value different from the given voltage level.

4,082,967

UNIFORMLY-COOLED SUPERCONDUCTING ROTOR

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,272
Int. Cl.² H02K *1/32*
U.S. Cl. 310—64 **13 Claims**



1. A cryogenic coolant flow circuit for a rotor having three axially-adjacent chambers therein, each chamber being open to its adjacent chamber through openings in a common wall therebetween and with superconductive windings situated within the inner chamber, said flow circuit comprising:

means for delivering liquefied cryogenic coolant into a first outer one of said chambers, said liquefied coolant flowing into said inner chamber and thence to the second outer one of said chambers through said openings;

first and second thermal distance extensions situated within said rotor axially outward of said first and second outer chambers, respectively, each of said thermal distance extensions being in gaseous communication with said first and second outer chamber, respectively, so as to receive vaporized coolant therefrom; and

heat exchanger means situated circumferentially about said rotor radially outward of said three chambers, said heat exchanger means being in gaseous communication with

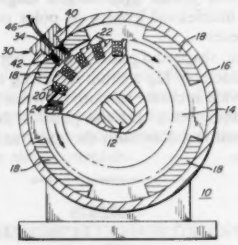
the radially-central region of said inner chamber so as to receive released by coolant boiling in said inner chamber.

4,082,968

SPEED DETECTOR FOR USE ON A DC MOTOR

Donald H. Jones, Pittsburgh, Pa., assignor to Contraves-Goerz Corporation, Pittsburgh, Pa.

Filed Nov. 23, 1976, Ser. No. 744,395
Int. Cl.² H02K *11/00*
U.S. Cl. 310—68 B **12 Claims**



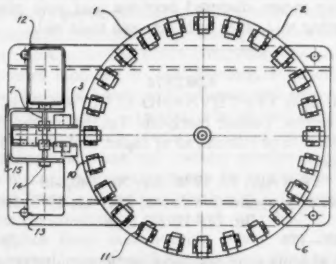
1. A permanent magnet motor comprising:
a stationary housing;
a plurality of permanent magnets supported within said stationary housing;
a rotor disposed within said stationary housing partially surrounded by said plurality of permanent magnets and being supported for rotational movement;
a plurality of rotor teeth formed on the outer surface of said rotor having armature windings disposed therebetween;
one of said permanent magnets having an opening formed therethrough;
a pickup stud formed of a magnetizable material connected to said housing and extending through the opening formed in said permanent magnet to a position in close proximity to said rotor; and,
a pickup winding wound around a portion of said pickup stud for sensing a signal from the rotor teeth as said rotor revolves.

4,082,969

MAGNETIC TORQUE CONVERTER

Donald A. Kelly, 58-06 69th Pl., Maspeth, New York, N.Y. 11378

Filed Sep. 7, 1977, Ser. No. 831,269
Int. Cl.² H02K *49/06*
U.S. Cl. 310—103 **10 Claims**



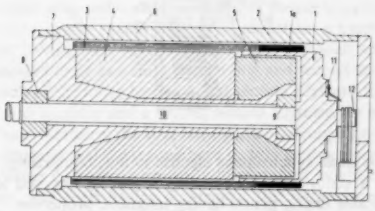
1. A magnetic torque converter comprising two basic rotating components,
a large flat non-magnetic disc containing multiple equally spaced identical permanent magnets arrayed so that their common poles (N) are exposed at the periphery,
a driving helical non-magnetic rotor containing identical equally spaced permanent magnets arrayed so that their common opposite poles (S) are exposed at the outer helical surface,
arrangement of said large flat non-magnetic disc and said driving helical non-magnetic rotor on a common centerline with rotating axes at a right angle to each other,
support means for said large flat non-magnetic disc including an elongate base and shaft with ball bearing means,
support means for said driving helical non-magnetic rotor including supporting brackets and shaft with ball bearing-means, securing of said supporting brackets onto said elongate base,
securing and locking means for each of said equally spaced permanent magnets onto said large flat non-magnetic disc and said driving helical non-magnetic rotor,
electric motor drive means for the shaft of said driving helical non-magnetic rotor, a coupling securing said electric motor to said shaft of the driving helical non-magnetic rotor,
a coupling secured to the shaft of said large flat non-magnetic disc.

4,082,970

DIRECT-CURRENT MOTOR-GENERATOR

Jean-Claude Girardin, La Chaux-de-Fonds, Switzerland, assignor to Portescap, La Chaux-de-Fonds, Switzerland

Filed Jul. 26, 1976, Ser. No. 708,425
Claims priority, application Switzerland, Aug. 12, 1975, 10457/75
Int. Cl.² H02K *47/04*
U.S. Cl. 310—113 **9 Claims**



1. A direct-current motor-generator which comprises at least one stationary magnetic circuit including a permanent magnet and having an air gap of substantially cylindrical shape, and a generally cup shaped rotor bearing a motor winding and a generator winding, wherein the spatial arrangement of the magnetic circuit and of the windings is such that during operation one of the windings cuts one portion of a magnetic flux path of the magnetic circuit and the other of the windings cuts another portion of said flux path.

4,082,971

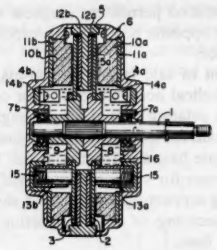
PRINTED MOTOR

Shiuichi Miyake, Washimiya, and Takao Saito, Tokyo, both of Japan, assignors to Nihon Radiator Co., Ltd. (Nihon Rajieeta Kabushiki Kaisha), Tokyo, Japan

Filed Feb. 10, 1977, Ser. No. 767,429
Int. Cl.² H02K *21/10*
U.S. Cl. 310—114 **1 Claim**

1. A printed motor, comprising two sheets of disk-shaped armatures (2, 3) mounted on a rotary shaft (1), which is borne by casing pieces (4*a*, 4*b*) provided with yokes (11*a*, 11*b*) on the sides confronting to the armatures (2, 3), a metallic intermedi-

ate ring (**5**) having a plate-shaped portion (**5***a*) provided with yokes (**12***a*, **12***b*) on both sides thereof and inserted between the



armatures (**2**, **3**), said intermediate ring (**5**) being connected between the casing pieces (**4***a*, **4***b*) to form a casing (**6**).

4,082,972

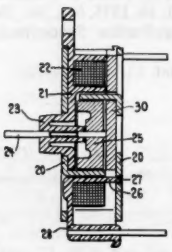
SMALL SYNCHRONOUS ELECTRIC MOTOR

Hermann Gerber, Courgevaux, and Michel Johner, Kerzers, both of Switzerland, assignors to Ebauches SA, Neuchatel, Switzerland

Continuation of Ser. No. 356,309, May 2, 1973, abandoned. This application Jul. 23, 1975, Ser. No. 598,148

Int. Cl.[2] **H02K** *19/00*

U.S. Cl. 310—162 **5 Claims**



1. A small synchronous electric motor, comprising:

(a) a stator casing formed by a pair of opposed identical stator casing pieces having magnetic properties

(b) each stator casing piece being a sheet metal stamping having a flat substantially circular central portion, and each piece being positioned with respect to each other so that the central portions are disposed in parallel spaced relation and form the outer casing surface

(c) a coil carrier assembly disposed within and supported by the stator casing and including an annular coil

(d) a rotor disposed within the annular coil of the coil carrier assembly and having a shaft which extends axially and outwardly through the stator casing

(e) first and second groups of poles extending from the central portion of each stator casing piece which occupy opposed sectors along a circle having a center which coincides with the shaft of the rotor and a diameter such that the poles are disposed adjacent the annular coil

(f) the length and width of the poles and their spacing being such as to permit interleaving of the first and second group of poles of one stator casing piece with the second and first group of poles respectively of the second stator casing piece

(g) an inverting axis passing through the circle center between each sector and having a fixed angular relation at one end with respect to the nearest pole of each group of poles

(h) an axis of symmetry passing through the circle center perpendicular to the inverting axis

(i) an assembly lug section on each stator casing piece within the sector of one group of poles extending axially to the central portion and symmetrically disposed to the axis of symmetry

(j) assembly lug section receiving means disposed on the central portion within the sector of the other group of poles diametrically opposite and in alignment with the assembly lug section for receiving and supporting the assembly lug sections

(k) the assembly lug section and the assembly lug receiving means when joined providing a magnetic return path between interleaved groups of poles on opposite stator casing pieces

(l) the length, shape and position of the lug assembly section and the assembly lug section receiving means being such as to provide accurate spacing between the plates as well as positioning such that the poles of both elements are readily positioned in both the axial and circumferential directions.

4,082,973

SYNCHRONOUS ELECTRIC MOTOR

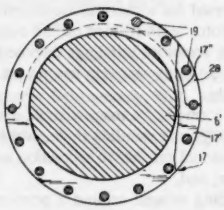
Lodewijk Schiethart, Dordrecht, Netherlands, assignor to Heemaf B.V., Hengelo, Netherlands

Filed Apr. 13, 1976, Ser. No. 676,515

Claims priority, application Netherlands, Apr. 29, 1975, 7505113; Apr. 29, 1975, 7505114; Apr. 29, 1975, 7505115

Int. Cl.[2] **H02K** *19/00*

U.S. Cl. 310—162 **8 Claims**



1. In a synchronous motor comprising a housing, a stator within said housing, a.c. winding means associated with said stator for producing a rotating magnetic field, d.c. winding means associated with said stator for producing a stationary magnetic field, a rotor journalled in said housing, a cage winding carried by said rotor and including a plurality of circumferentially spaced rods, and a plurality of pole pieces carried by said cage winding, said pole pieces including portions penetrated by some of said rods and other portions underlying other of said rods whereby said other rods are unsupported between their ends, the improvement which comprises:

connecting means disposed between said pole pieces for supporting said other rods between their ends.

4,082,974

GAP WINDING TYPE DYNAMO-ELECTRIC MACHINE

Hiroe Yamamoto, Tohkai; Noriyoshi Takahashi, and Miyoshi Takahashi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 27, 1976, Ser. No. 680,866

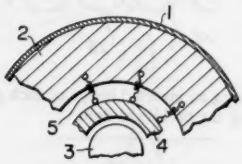
Claims priority, application Japan, May 12, 1975, 50-54543

Int. Cl.[2] **H02K** *1/00*

U.S. Cl. 310—179 **20 Claims**

1. A gap winding type dynamo-electric machine comprising a rotor mounted on a rotatably supported shaft, a slotless annular stator concentrically surrounding said rotor and being spaced therefrom to form an annular gap with the outer periphery of said rotor, and an armature winding located in said

annular gap along the inner periphery of said stator, support means for supporting said armature winding from said stator while permitting displacement of said armature winding relative to said stator in the circumferential direction; wherein said support means includes support members provided at circum-



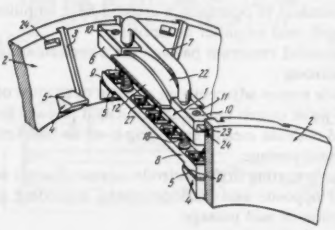
ferentially spaced positions in an axially central portion and opposite end portions of said stator; and wherein each support member of said supporting means is directly secured at one end to said armature winding and supported at the other end by said stator via an elastic member.

4,082,975

BRUSH MOUNTING DEVICE FOR DYNAMOELECTRIC MACHINE

Evgeny Mikhailovich Azarov, Zagorodny prospekt, 45, kv. 22; Valery Nikolaevich Andrushev, Novo-Izmailovsky prospekt 44, korpus 1, kv. 6, and Garri Mikhailovich Khutoretsky, Altaiskaya ulitsa 2, kv. 5, all of Leningrad, U.S.S.R.

Filed Mar. 11, 1976, Ser. No. 665,875
Int. Cl.[2] H02K *13/10*
U.S. Cl. 310—239 **5 Claims**



1. A brush mounting device for a dynamoelectric machine comprising,

a pair of stationary current-conducting plates spaced apart substantially parallel to each other and rigidly connected together;

a pair of plate contact members, each plate contact member fixedly secured to each stationary current-conducting plate, said plate contact members having generally planar contact surfaces, wherein said contact surfaces are substantially perpendicular to the current-conducting plate;

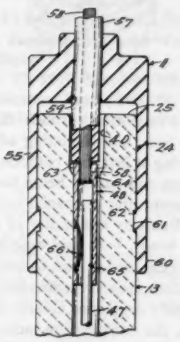
a removable brush unit for mounting between said stationary current-conducting plates comprising a housing, contact brushes mounted to said housing, a handle means for moving said brush unit between said pair of stationary current-conducting plates, a brush unit contact member having a generally planar contact surface, means for connecting said brush unit contact member to said housing, contact brush retaining means for retaining said brushes in said housing when said brush unit is removed from said current-conducting plates and for releasing said contact brushes from said housing when said brush unit is mounted between said current-conducting plates, wherein when said brush unit is mounted between said current-conducting plates, the contact surfaces of said plate contact member and said brush unit contact member are aligned in the same plane in contact making engagement, and securing means for securing said brush unit between said current-conducting plates.

4,082,976

SPARK PLUG DESIGN HAVING TWO ELECTRICALLY ISOLATED CENTER ELECTRODES

Lawrence R. Lentz, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Jun. 21, 1976, Ser. No. 699,847
Int. Cl.[2] H01T *13/04*
U.S. Cl. 313—135 **5 Claims**



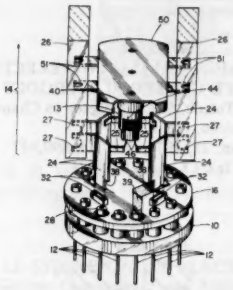
1. A spark plug and connector assembly for use in an internal combustion engine comprising, in combination, a cylindrical insulator having two bores extending therethrough substantially parallel to its axis and between first and second insulator ends, each of the bores having a first section adjacent the first end of said insulator and a second section adjacent the second end of said insulator, the first bore section having a predetermined diameter and the second bore section having a predetermined larger diameter, a generally tubular shell mounting said insulator, said shell having a threaded end circumjacent the first bore sections for engaging the internal combustion engine, two electrodes each having a terminal end within one of the second bore sections extending through one of the first bore sections projecting from the first end of said insulator and having a firing end outside said insulator, the firing ends of said electrodes being in spark gap relationship with one another, and the terminal ends of each of said electrodes having a diameter smaller than the predetermined diameter of the second bore sections, means mounting each of said electrodes within said insulator, two insulated high-voltage ignition cables, and two connectors, one connector attached to and in electrical contact with an end of each of said cables, each of said connectors and an adjacent portion of the attached one of said insulated cables being entirely within one of the bores of said insulator, and each of said connectors including a generally tubular metal housing having an internal opening of a diameter greater than that of the terminal ends of said electrodes and an external diameter smaller than the predetermined diameter of the second bore sections, each of said housings being entirely within one of the second bore sections and each of the terminal ends of said electrodes being within one of said housings, and a spring projecting inwardly into the internal opening of each of said housings, and resiliently engaging an electrode terminal end.

4,082,977

ELECTRON GUN FOR CATHODE RAY TUBE DETACHABLE FROM BASE SUPPORT

Horst H. Blumenberg, Elmwood Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed May 24, 1976, Ser. No. 689,611
Int. Cl.[2] H01J *29/02, 29/82*
U.S. Cl. 313—457 1 Claim



1. For use in a television cathode ray tube having a neck terminated by a base, and including adjacent to the base an electron gun having at least one cathode for generating at least one electron beam and having beam focusing electrodes supported as a coherent unit in spaced tandem succession along the gun's central axis by a plurality of elongated, axially oriented structural beads, with said base having therethrough a plurality of electrical lead-in pins to convey applied operating voltages to said cathode and electrodes, said gun having a gun support plate rigidly supported closely adjacent to said base by said lead-in pins, the combination including quick-mount gun mounting means for rapidly and rigidly interconnecting said gun and said support plate, said quick-mount mounting means including male-female socket components, said gun having one socket component including means embedded in at least one of said beads, said plate having means defining the other socket component said socket component for said gun comprising a support standard having a portion transverse to said central axis embedded in said bead, and a portion parallel to said axis which cooperates with said means defining said other socket component in said plate, said socket components providing for facile and secure plugging together of said gun and said base, and wherein said combination includes electrically conductive means connected between at least one of said lead-in pins and one of said electrodes, said male-female socket components providing also for the facile and secure plugging together of electrical conductive paths between one of said electrical lead-in pins and one of said electrodes to transmit electrical voltages or currents therebetween, and wherein one of said electrically conductive paths comprises a printed electrical conductor on said gun support plate between said lead-in pin and said socket components.

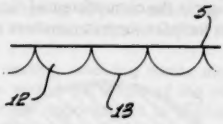
4,082,978

COLOR TELEVISION, HAVING SUPERIMPOSED COLORS

Peter Schwarz, 1501 Rexford Drive, Los Angeles, Calif. 90035

Continuation of Ser. No. 401,263, Sep. 27, 1973, which is a division of Ser. No. 36,294, May 11, 1970, Pat. No. 3,763,389. This application Apr. 11, 1975, Ser. No. 567,057
Int. Cl.[2] H01J *29/28, 29/32*
U.S. Cl. 313—474 5 Claims

1. In color television, the method of forming a picture on a screen consisting of groups of 2 or more dots emitting differently colored light forward and backward in combination with



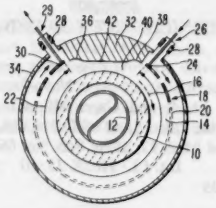
the step of reflecting an inverted image of each group back to its group, utilizing the backward light.

4,082,979

METHOD AND APPARATUS FOR REDUCING NOISE IN CROSSED-FIELD AMPLIFIERS

George K. Farney, and Fred A. Feulner, both of Boxford, Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 29, 1976, Ser. No. 727,722
Int. Cl.[2] H01J *25/34*
U.S. Cl. 315—39.3 22 Claims



1. A method of operating a crossed field amplifier at a low noise level, said amplifier comprising:

an extended reentrant passage for a recirculating stream of electrons,

cathode means adjacent said passage over most of its extent,

slow-wave circuit means adjacent said passage and opposite said cathode means, extending over an interaction section of said passage,

non-propagating drift electrode means adjacent said passage and opposite said cathode means, extending over a drift section of said passage,

said method including:

applying a magnetic field generally parallel to said cathode means and perpendicular to the extend of said passage,

applying a first electric field strength between said cathode means and said circuit means, and

applying between said cathode means and a portion of said drift electrode means inwardly from both ends of said drift section a second electric field strength higher than said first strength.

4,082,980

SPARK PLUG CAP PROVIDING A CAPACITOR IN PARALLEL WITH THE SPARK CAP

Masazi Yoshikawa, and Tomoe Sawada, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan, a part interest

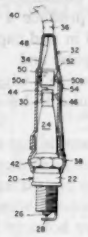
Filed Feb. 9, 1976, Ser. No. 656,723
Claims priority, application Japan, Feb. 13, 1975, 50-21425[U]; May 15, 1975, 50-65019[U]; Feb. 17, 1975, 50-66088[U]; Jun. 12, 1975, 50-81296[U]
Int. Cl.[2] H01T *13/04, 13/40*
U.S. Cl. 315—59 22 Claims

1. A spark plug cap for electrically and mechanically connecting a spark plug to an ignition current supply cord to intensify sparking across the gap between central and ground electrodes of the spark plug, which comprises:

an insulating body, said insulating body including means for

mechanically connecting said cap to said spark plug and terminal means adapted to be connected to said supply cord;

electrically conductive means extending through said insulating body to electrically connect said terminal means to said central electrode of said spark plug; and



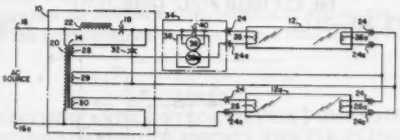
at least one capacitor unit embedded essentially entirely within said body and electrically connected in parallel to said spark gap, said capacitor unit comprising an essentially flat capacitor having a flat dielectric base and a pair of electrodes attached on the opposite sides of said dielectric base.

4,082,981

ENERGY SAVING DEVICE FOR A STANDARD FLUORESCENT LAMP SYSTEM

Edward W. Morton, Bronx, N.Y., and John F. Gilmore, Verona, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1977, Ser. No. 772,790
Int. Cl.[2] H05B *41/40;* H01J *17/34*
U.S. Cl. 315—97 **6 Claims**



1. In combination with a rapid-start type ballast for two low-pressure mercury-discharge fluorescent lamps comprising an autotransformer adapted to be connected across an AC energizing source, said lamps connected in series circuit relationship with ballasting capacitor means with the series combination connected across the primary and the secondary of said autotransformer, said lamps each having two contacts at each end thereof connecting to electrodes operatively positioned proximate the ends of said lamps, additional heater windings in transformer relationship with the primary of said autotransformer and connecting to each of said lamp contacts to preheat said lamp electrodes upon energization of said ballast, and a starting capacitor connected in parallel with one of said lamps to facilitiate series-sequence starting of said lamps, the improvement which comprises:

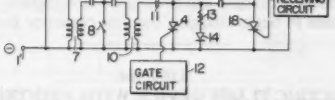
a power reducing means included in series relationship with the two contacts at one end of said lamps, said power reducing means comprising switch means which initially upon energization has a low impedance state to permit current flow and then switches to a high impedance state, said switch means comprising a first switch member in series with one of said contacts at said one end of said one lamp, a second switch member connected in series with the other of said contacts at said one end of said one lamp, and a current limiting capacitor means of predetermined capacitance connected in parallel circuit arrangement across one of said switch members, whereby when the circuit is initially energized, said switch means permits preheating of said lamp electrode connecting to said contacts at said one end of said one lamp, and thereafter upon response to current flow said switch means switches and causes the lamp current to pass through said current limiting capacitor means and decrease by a predetermined amount the current through said normally operating lamps.

4,082,982

AUTOMATIC ELECTRONIC FLASH DEVICE

Shinji Hirata, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed Feb. 17, 1977, Ser. No. 769,710
Claims priority, application Japan, Feb. 19, 1976, 51-17652
Int. Cl.[2] H05B *41/30, 41/36*
U.S. Cl. 315—151 **3 Claims**



1. An automatic electronic flash device comprising:

a series connection of a first switching element which includes an anode, a cathode and a control electrode and a flash discharge tube,

a main discharge capacitor which is connected in parallel with said series connection and is adapted to be charged to high voltage,

a trigger circuit which includes a trigger capacitor and a trigger transformer, the charged energy of said trigger capacitor being discharged through the primary winding of said trigger transformer thereby to generate a high voltage pulse through the secondary winding of said trigger transformer, and said high voltage pulse being fed to the trigger electrode of said flash discharge tube,

a gate circuit which supplies a gate voltage to said control electrode of said first switching element,

a light receiving circuit which receives light reflected from an object to be photographed and supplies a flash stopping signal when the amount of the received light reaches a predetermined value,

a second switching element which is turned on in response to said flash stopping signal,

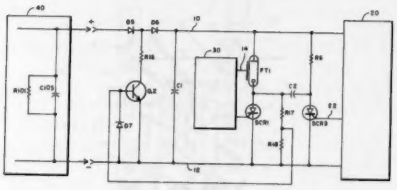
a commutation capacitor which is made to discharge in response to said second switching element being turned on and supplies a reverse current between said anode and said cathode of said first switching element thereby to turn off said first switching element, and

a high voltage supply circuit which generates a high voltage in synchronism with the operation of said trigger circuit so that the generated voltage is superposed on the charging voltage of said main discharge capacitor and the resulting voltage is applied across the main electrodes of said flash discharge tube.

4,082,983
CAPACITOR CHARGING SYSTEM FOR ELECTRONIC FLASH APPARATUS

James R. Adams, Jr., Littleton, Colo., assignor to Rollei of America, Inc., Littleton, Colo.

Continuation of Ser. No. 589,220, Jun. 23, 1975, abandoned.
This application Dec. 9, 1976, Ser. No. 748,785
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—241 P 20 Claims

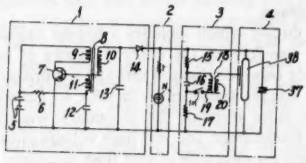


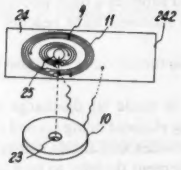
1. Electronic flash apparatus comprising:
flash tube means for producing a light flash;
first capacitor means for providing electrical current to the flash tube means;
second capacitor means for discharging during the light flash, the second capacitor means being recharged from the first capacitor means subsequent to the termination of the light flash;
first capacitor charging means for charging the first capacitor means; and
control means for sensing when the second capacitor means is being recharged and causing the first capacitor charging means to begin charging the first capacitor means.

4,082,984
ELECTRIC FLASH DEVICE WITH PRINTED COIL TRANSFORMER

Hiroshi Iwata, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed May 5, 1976, Ser. No. 683,614
Claims priority, application Japan, May 12, 1975, 50-56591
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—241 P 10 Claims



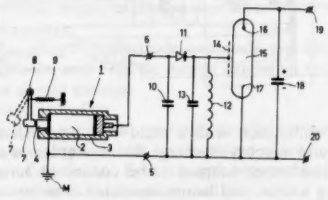


1. An electric flash device comprising
a battery,
a transistorized DC-DC converter for converting D.C. output voltage of said battery to an output of an elevated D.C. voltage, which converter includes an oscillating transistor, at least one resistor, capacitors, a convertor transformer and a rectifying diode,
a capacitor connected across the output terminals of said converter for accumulating said elevated voltage D.C. output of said DC-DC converter,
a gas-discharge lamp connected across both ends of said capacitor so as to produce a flash of light when said charge accumulated in said capacitor is discharged upon receiving a trigger pulse and
a trigger circuit comprising a trigger transformer for generating said trigger pulse to be impressed to said gas discharge lamp,
wherein the improvement is that said converter transformer comprises at least one printed coil formed on an insulation substrate as a printed coil, at least one output coil formed by winding fine insulated wire and a magnetic core inserted in both center holes of said printed coil and said output coil, said printed coil and said output coil being disposed electromagnetically to couple to each other.

4,082,985
GAS DISCHARGE FLASH LAMP WITH PIEZOELECTRIC TRIGGER GENERATOR

Pieter Jan Bolhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,527
Claims priority, application Netherlands, Feb. 10, 1976, 7601312
Int. Cl.[2] H05B *41/32;* G03B *15/03*
U.S. Cl. 315—241 P 5 Claims

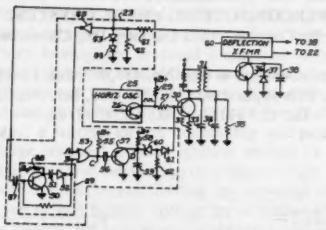


1. A device provided with a gas discharge flash lamp having a discharge tube provided with two internal main electrodes and an external starting electrode, the device comprising two input terminals intended for connection to a mechanically operable piezo-electric element which, when operated mechanically supplies in its electrically unloaded state mainly one starting pulse of a non-changing polarity for igniting the lamp, a voltage produced by means of the piezo-electric element being applied — via the input terminals — between the starting electrode and a first main electrode of the lamp, means connecting the main electrodes to an electric supply source, characterized in that the input terminals are interconnected by a series circuit of a rectifier and a parallel arrangement of an inductive and a capacitive impedance, wherein said parallel arrangement constitutes an undercritically damped circuit, and wherein a connection from the starting electrode to the first main electrode of the lamp comprises the inductive impedance but is free from the rectifier, the pass direction of the rectifier being chosen such that it passes a pulse produced at the input terminals with the same polarity as the starting pulse of the piezo-electric element.

4,082,986
HIGH VOLTAGE SHUTDOWN CIRCUIT FOR A TELEVISION RECEIVER

Paul Gamboa, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Feb. 27, 1976, Ser. No. 662,190
Int. Cl.[2] H01J 29/70
U.S. Cl. 315—411 **9 Claims**

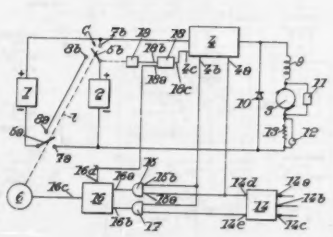


1. In a television receiver including: a cathode ray tube requiring a high DC operating potential; a deflection system generating scansion voltages at line and field frequency rates including oscillator means producing an oscillatory signal in synchronism with the line synchronizing components in a received television signal; yoke means mounted adjacent said cathode ray tube for scanning an electron beam in said cathode ray tube across the viewing screen thereof; transformer means developing line scansion currents from said oscillatory signal for application to said yoke means, said transformer means developing retrace pulses at said line frequency rate; means developing said high DC potential from said retrace pulses; and deflection system disabling means including pulse producing means for producing a standard pulse of a predetermined duration responsive to occurrence of a retrace pulse and a comparator for comparing the duration of said retrace pulses with the predetermined duration of said standard pulse.

4,082,987
METHOD AND CONTROL DEVICE FOR SWITCH MEANS ADAPTED TO MODIFY THE COUPLING OF GROUPS OF ELEMENTS OF AN ELECTROCHEMICAL GENERATOR SUPPLYING AN ELECTRIC MOTOR

Jean Cadiou, Paris, France, assignor to Societe Anonyme Automobiles Citroen, France

Filed Sep. 13, 1973, Ser. No. 396,804
Int. Cl.[2] H02P 7/06
U.S. Cl. 318—139 **9 Claims**



1. Apparatus for controlling a power supply for an electric motor comprising:

at least two groups of electromechanical generating means for supplying electrical energy to said motor;

means for monitoring at least one operating condition of said motor;

chopper means coupled between the output of said at least two groups of generating means and an input of said motor for supplying pulse signals to energize said motor;

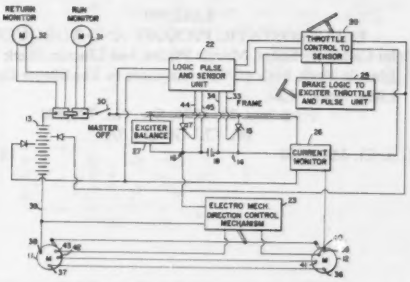
commutation means coupled to said at least two groups of electrochemical generating means for switching the coupling of said at least two groups between series and parallel coupling as a function of said operating condition of said motor; and

control means coupled to outputs of said monitoring means and chopper means and to an input of said commutation means for synchronizing the switching of said commutation means with the pulse producing operation of said chopper means.

4,082,988
ELECTRIC POWER PLANT FOR MOTOR DRIVEN VEHICLES

Roy O. Reime, San Jose, and Byron C. Stewart, Campbell, both of Calif., assignors to Richard Dorst, Atherton, Calif.

Continuation-in-part of Ser. No. 347,103, Apr. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 157,203, Jun. 28, 1971, abandoned. This application May 5, 1975, Ser. No. 574,666
Int. Cl.[2] H02P 7/28
U.S. Cl. 318—139 **20 Claims**



1. A battery operated electric power system for a motor driven operator controlled vehicle comprising:

electric motor means for driving the vehicle;

electric generator means driven by motion of the vehicle for providing a battery charging voltage;

means for alternating operating said motor means and said generator means during motion of the vehicle to define a repetititve system operating cycle having a motor portion and a generator portion; and

means for varying the relative duration of said motor portion of said cycle and said generator portion of said cycle said varying means including power demand means controllable by said operator.

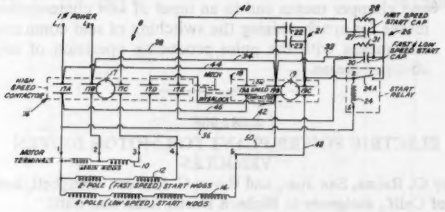
4,082,989
SWITCHING CONTACTOR CIRCUIT FOR FIVE-LEAD TWO-SPEED SINGLE-PHASE MOTOR

David M. Pfarrer, Hurst, Tex., assignor to Lennox Industries, Inc., Marshalltown, Iowa

Filed Jan. 13, 1976, Ser. No. 648,623
Int. Cl.[2] H02P 1/44
U.S. Cl. 318—224 A **9 Claims**

1. A motor control circuit for a single-phase two-speed motor including main windings, high speed start windings and low speed start winding, said circuit including high speed contactor means, low speed contactor means, start capacitor means, run capacitor means, and start relay means, with the improvement characterized by said start capacitor means including a high speed start capacitor and a low speed start capacitor in parallel therewith, said start relay means, includ-

ing a start relay coil and a normally closed contact disposed between the start windings and the start capacitors, whereby during high speed motor operation, both start capacitors are in



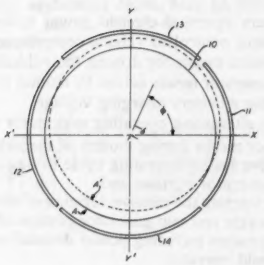
the circuit until the start relay contact is opened, and during low speed motor operation only the low speed start capacitor is in the circuit until the start relay contact is opened.

4,082,990

ELECTROSTATIC PICKOFF AND TORQUER

John Callender Stiles, Morris Plains, and Lincoln Stark Ferriss, Lincoln Park, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Sep. 29, 1976, Ser. No. 727,888
Int. Cl.[2] G05B *1/06*
U.S. Cl. 318—662 **11 Claims**



1. An electrostatic pickoff and torquer usable for sensing and controlling the position of the moving element of an instrument, comprising:

a moving element capable of motion in any direction in the plane defined by orthogonal X and Y axes and movable simultaneously along both of said X and Y axis,

a first pair of electrodes mounted on one end of said moving element parallel to said X axis,

a second pair of electrodes mounted orthogonally to said first pair of electrodes on said end of said moving element parallel to said Y-axis,

a plurality of fixed plate electrodes oriented parallel to the plane of said moving element and overlying said electrodes of said moving element in predetermined positions of motion of said moving element said fixed plate electrodes separated by a narrow gap from said moving element, and

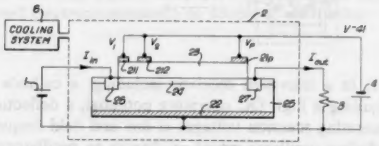
means for sensing changes in capacitance between said fixed plate electrodes and moving element because of a change in the area of said fixed plate electrodes overlying said moving element.

4,082,991

SUPERCONDUCTING ENERGY SYSTEM

James Nickolas Constant, 1603 Danbury Dr., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 487,597, Jul. 11, 1974, abandoned. This application Oct. 23, 1975, Ser. No. 625,188
Int. Cl.[2] H02J *15/00*; G11C *11/44*
U.S. Cl. 320—1 **13 Claims**



8. A method of cryogenic energy storage comprising the steps of:

connecting a plurality of charge coupled energy storage elements capable of storing electromagnetic energy in the form of charges in commercial power amounts, such as kilowatts, in an array of elements, including input, output, and intermediate elements;

cooling said elements to cryogenic temperatures;

feeding a source of electrical energy to the input elements;

forming charges in the elements;

propagating charges through the array of elements by applying a source of one of a transfer control current and voltage to selected elements to move charges from element to element; and

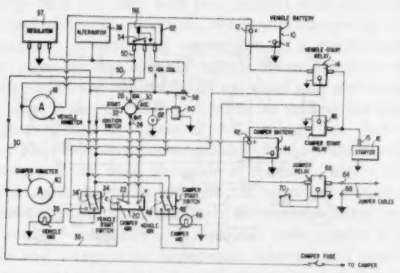
recovering the charges from the output elements.

4,082,992

TWIN IGNITION AND TWIN ELECTRICAL START SYSTEM FOR A VEHICLE

Oliver E. Day, R.R. No. 3, Box 414, Bonner Springs, Kans. 66012

Filed Jan. 18, 1977, Ser. No. 760,280
Int. Cl.[2] H02J *7/14*
U.S. Cl. 320—6 **4 Claims**



1. An electrical circuit arrangement for a vehicle which permits the starting voltage and/or the ignition voltage for the vehicle engine to be derived from the vehicle battery or from an attached camper battery, and which permits simultaneous charging of both batteries comprising in combination:

a vehicle battery having one terminal connected to ground;

a vehicle starter relay; a starter motor having one terminal connected to ground and its other terminal connected via the controlled current path of said vehicle starter relay to the other terminal of said vehicle battery; a vehicle alternator having is output connected to said other terminal of said vehicle battery; a conventional vehicle ignition switch having a battery voltage input terminal and at least an ignition voltage output terminal which is connected to the ignition coil, and a starter control voltage output terminal; a first switch connecting said starter control voltage output terminal of said ignition switch to the control terminal of said vehicle starter relay; a camper battery having one terminal connected to ground; first circuit means, including the controlled current path of a further starter relay, for connecting the other terminal of said camper battery to said other terminal of said starter motor; a second switch connecting said starter control voltage terminal of said ignition switch to the control terminal of said further starter relay; a single pole double throw switch means, having its movable contact connected to said battery voltage input terminal of said ignition switch, for selectively connecting said battery voltage input terminal to said other terminal of said vehicle battery or said other terminal of said camper battery, whereby the position of said switch means determines which of the batteries supplies the voltage for the vehicle motor ignition coil and for control of said starter relays and the closure of one or both of said first and second switches determines which one or both of the batteries supplies the starter voltage; and, second circuit means for connecting said output of said alternator to said other terminal of said camper battery only when an output voltage is present at said ignition voltage output terminal of said ignition switch and no output voltage is present at said starter control voltage output terminal of said ignition switch.

4,082,993

GAS APPLIANCE VALVE AND ADAPTOR

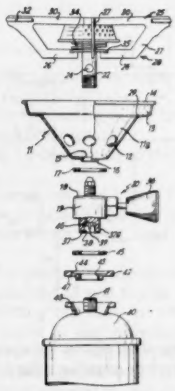
Malcolm Campbell Oakes, Wilmslow, England, assignor to Taymar Limited, Stockport, England

Filed May 28, 1976, Ser. No. 691,208

Claims priority, application United Kingdom, May 30, 1975, 23558/75

Int. Cl.[2] F16L *37/28*; F23D *13/04*

U.S. Cl. 137—322 **5 Claims**



1. An adaptor in combination with a control valve of the type having a pin for cooperating with a self-sealing outlet valve in a gas container having an externally threaded connection for adapting the control valve for use with a refillable gas container having an internally threaded connection, the combination comprising a body having a through passage with an inlet portion and an outlet portion for gas flow therethrough, valve means located in said body operative to open and close said through passage, the inlet portion of the valve body being in the form of a boss having internal and external threads concentrically surrounding said pin, and an adaptor element having an axial bore therethrough and an externally threaded portion engageable with the internal threads of said inlet portion and having a projection extending away from said externally threaded portion of said adaptor element for operating a self-sealing outlet valve of the refillable gas container having an internally threaded connection when the external inlet threads on the valve body are engaged with said internal threads of the connection of the gas container.

4,082,994

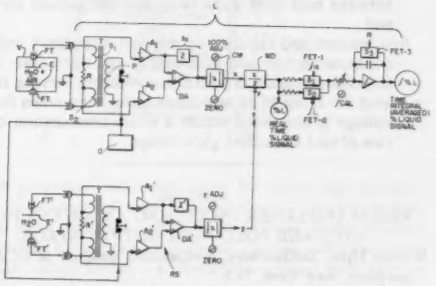
VAPOR/LIQUID FRACTION DETERMINATION

Robert E. Newton, Tewksbury, Mass., assignor to Auburn International, Inc., Danvers, Mass.

Continuation-in-part of Ser. No. 719,196, Aug. 31, 1976. This application Sep. 10, 1976, Ser. No. 722,168

Int. Cl.[2] G01N *27/42*

U.S. Cl. 324—30 R **9 Claims**



1. Method of determining liquid and vapor fractions in a resistive conductive fluid comprising completing multiple electrical current loops through the fluid by applying a 1–30 kiloherz oscillating voltage to multiple poled electrode pairs immersed in the fluid and measuring the absolute value of an electrical parameter, variable as a function of admittance through each said loop as affected by the admittance of the fluid between electrodes of each such pair, as a measure of the liquid fraction at the time of measurement, while isolating reactive and resistive cross conduction between the said current loops and further isolating external common mode noise and

further comprising, generating a similar reference parameter measurement in a bath of 100% liquid fluid related to the fluid to be measured for fraction wherein the fraction parameter measurement is automatically divided by the reference (100% liquid) parameter measurement to establish a quotient related electrical signal.

4,082,995

CIRCUIT TESTER WITH RELIABLE INDICATION MEANS

John M. Rhude, Providence, R.I., assignor to General Electric Company, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,204

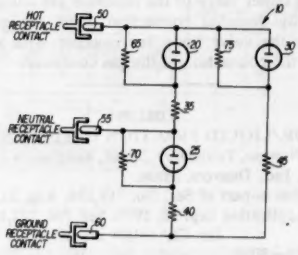
Int. Cl.[2] G01R *31/02, 19/16*

U.S. Cl. 324—51 **1 Claim**

1. In a receptacle tester of the type having hot, neutral and ground terminals for connection to the hot, neutral and ground contacts of a three-wire ground type electrical receptacle, for testing the wired condition of the receptacle, the improvement comprising:

first, second, and third glow lamps, said first and third glow lamps being connected to said hot terminal of the receptacle tester and said second glow lamp being connected to said neutral terminal of the receptacle tester;

first, second and third series resistors, said first series resistor being connected between said first glow lamp and the neutral terminal, said second series resistor being connected between said second glow lamp and the ground terminal and said third series resistor being connected between said third glow lamp and the ground terminal; and



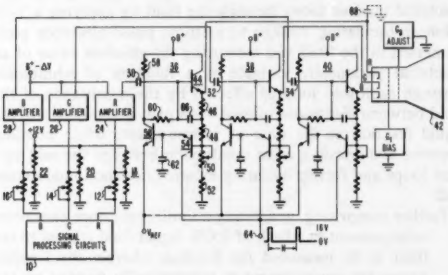
first, second and third shunt resistors associated with and connected across said first, second and third glow lamps, respectively, each of said shunt resistors serving to prevent the firing of an associated glow lamp when full line voltage is impressed across a series combination of any two of said associated glow lamps.

4,082,996

VIDEO AMPLIFIER INCLUDING AN A-C COUPLED VOLTAGE FOLLOWER OUTPUT STAGE

Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Sep. 27, 1976, Ser. No. 727,044
Int. Cl.² H04N *5/68, 9/18*
U.S. Cl. 358—242 **8 Claims**



1. Video amplifier apparatus suitable for providing amplified image-representative signals to an image reproducing device having a capacitive input impedance component, the apparatus comprising:

a first wideband amplifier stage for providing a video signal voltage gain greater than unity; and

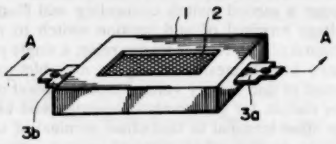
a second wideband amplifier stage for providing approximately unity video signal voltage gain, said second stage comprising at least one amplifying device having input, output and common terminals, an output load circuit comprising at least first and second resistors coupled in series relation between said output and common terminals, means for coupling amplified signals from said output terminal to said image reproducing device, a first capacitor for coupling amplified signals from said first stage to said input terminal of said second stage, and a second capacitor coupled from said input terminal to a junction between said first and second resistors for coupling video signal excursions of a polarity tending to reduce conduction of said amplifying device to said output terminal.

4,082,997

OIL DETECTING DEVICE

Takao Ohtsu; Yukinobu Nakamura, and Akira Sugimoto, all of Yokohama, Japan, assignors to Japan Gasoline Co., Ltd., Japan

Filed Jun. 23, 1975, Ser. No. 589,538
Claims priority, application Japan, Jun. 25, 1974, 49-73047
Int. Cl.² G01R *27/02;* **H01C** *8/00;* **B01D** *13/00, 39/00*
U.S. Cl. 324—65 R **4 Claims**



1. An oil detecting element comprising:

a container having one opening therein;

a water repellent, oil passing filter member closing said opening; and

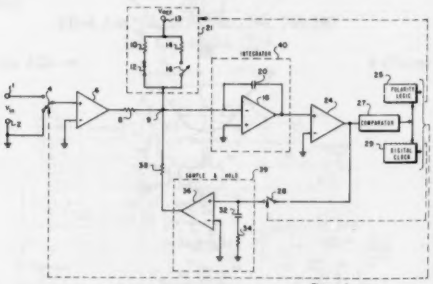
an electrically conductive particle layer made of particles which are formed from a material selected from the group consisting of carbon, metal oxides and metal provided in said container whereby when said particle layer is soaked with oil which has passed through said filtering member, the oil comes in contact with the conductive particles and interposes between particles and causes the electrical resistance of said particle layer to increase.

4,082,998

DUAL SLOPE INTEGRATION CIRCUIT

Joe E. Marriott, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 591,266, Jun. 30, 1975, abandoned.
This application Mar. 14, 1977, Ser. No. 777,297
Int. Cl.² G01R *17/06;* **H03K** *1/02, 13/02*
U.S. Cl. 324—99 D **5 Claims**



3. A dual slope integration circuit for operating on an input voltage of either positive or negative polarity, the circuit comprising:

input means having an input for receiving the input signal and operable in first and second operating modes for selectively producing either a reference output current or an output current responsive to the input signal during operation in the first and second operating modes, respectively:

single polarity step variable current source means for con-

trollably supplying an output current having one non-zero amplitude during initial operating of the input means in the first and second operating modes and having an amplitude which is selectively less than or greater than the one non-zero amplitude during subsequent operation of the input amplifier means in the first operating mode;

current integration means having an input coupled to receive the output currents from said input means and from said source means for producing an output signal representative of the time integral of currents applied to the input thereof;

sample holding means coupled to said current integration means for selectively sampling the output signal produced therefrom during operation of said input means in the first operating mode and for concurrently and subsequently applying to the input of said current integration means a feedback current in response to the output signal selectively sampled which alters the output signal produced by said current integration means to substantially equal a reference value during the selective sampling;

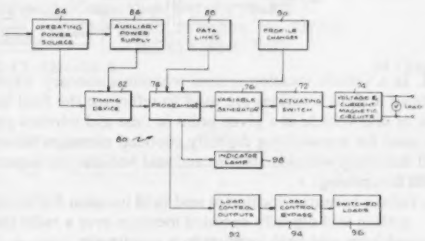
logic means cooperating with said current integration means, cooperating with said input amplifier means, cooperating with said source means and cooperating with said sample holding means for controlling the operations thereof in first and second operating modes and for establishing a relationship between the durations of such modes which is representative of the value of the input signal.

4,082,999

PROGRAMMABLE VARIABLE-RATE ELECTRIC ADAPTING DEVICE FOR WATT-HOUR METERS

Anthony Gail Staker, 23526 Oxnard St., Woodland Hills, Calif. 91364

Filed Jun. 30, 1976, Ser. No. 701,369
Int. Cl.[2] G01R *15/08, 1/04*
U.S. Cl. 324—116 **1 Claim**



1. A programmable variable-rate electric adapting device for watt-hour meters comprising:

first terminals for connecting to the contact jaws of a watt-hour meter socket receptacle;

second terminals for connecting to the blades of a watt-hour meter; and

a variable rate circuit coupled to said first and second terminals so as to be in parallel with the line voltage measuring coil of the watt-hour meter, said variable rate circuit comprising:

a digital clock for generating signals establishing the time;

a programmer coupled to said digital clock to receive said signals establishing the time, to select a predetermined scaling rate stored in said programmer based upon the time, and to provide an output signal that is indicative of said selected predetermined scaling rate;

a variable generator coupled to said programmer to receive said selected predetermined scaling rate output signal and to generate switch drive signals corresponding to said selected predetermined scaling rate; and

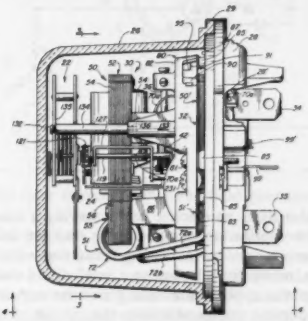
a solid state actuating switch coupled to said variable generator and coupled to the line voltage measuring coil of the watt-hour meter when said variable-rate circuit is coupled to said second terminal, said actuating switch responding to said switch drive signals to either allow current from the line to flow through the line voltage measuring coil during an on cycle or to prevent current from flowing through said line voltage measuring coil during an off cycle.

4,083,000

ROTATING DISC MULTIELEMENT POLYPHASE METER

Dale F. Becker, Seneca, S.C., assignor to Sangamo Weston, Inc., Springfield, Ill.

Filed Sep. 7, 1976, Ser. No. 720,602
Int. Cl.[2] G01R *11/04, 11/06*
U.S. Cl. 324—137 **6 Claims**



1. A polyphase watthour meter for measuring electrical power consumption for an electrical circuit, a base plate having an inner concave surface; a supporting frame member comprising a casting of non-magnetic, electroconductive material; said casting having a generally disc-shaped body portion extending parallel to said base plate and including a first concave surface disposed adjacent to said concave surface of said base plate and cooperating therewith to define a cavity, and a second surface facing the front of said meter; first fastener means for securing said supporting frame to said base plate; first and second electromagnetic means each having an air gap, said first and second electromagnetic means each having a longitudinal axis; said casting providing first spacer means extending toward said base plate, second spacer means extending from said second surface thereof toward the front of said meter, third spacer means extending from said second surface thereof and located outside said second spacer means, a pair of diametrically spaced projections on said second surface, and a housing on said second surface; second fastener means for mounting said first electromagnetic means to said first spacer means and in said cavity; third fastener means for mounting said second electromagnetic means to said second spacer means with the longitudinal axes of said first and second electromagnetic means located respectively in first and second parallel spaced planes which extend parallel to said base plate with associated air gaps in alignment in a third plane which extends perpendicular to said first and second planes; a shaft rotatably mounted to said projections on said frame casting; an electroconductive disc mounted on said shaft for rotation about an axis extending substantially perpendicular to said third plane and through the aligned air gaps; winding means for each of said electromagnetic means effective when energized to establish a shifting magnetic field in the associated air gap to apply a torque to said disc for rotating said disc in correspondence with power consumption by said circuit; damper magnet means mounted in said housing of said frame casting; a register; fourth fastener means for securing said register to said third spacer means of said frame casting in a forward portion of the meter; and a coupling gear box assembly mounted on said frame casting in operative relationship

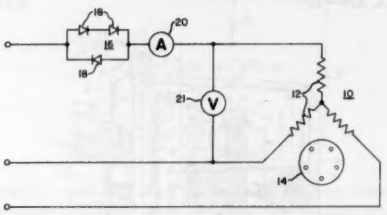
with said register for coupling said shaft to said register to permit said register to be driven in correspondence with the revolutions of said disc.

4,083,001

MEASUREMENT OF MOTOR WINDING TEMPERATURE

Derek A. Paice, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 29, 1976, Ser. No. 755,381
Int. Cl.[2] G01R *31/06, 27/02*
U.S. Cl. 324—158 MG **10 Claims**



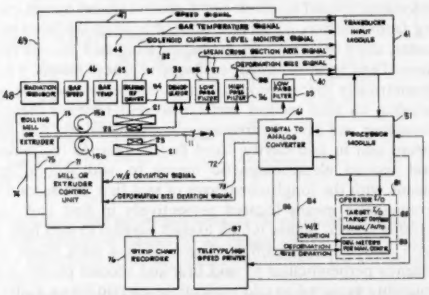
1. In combination, an electric motor having a winding with terminals for application of alternating current thereto, said winding characterized by increasing resistance with increasing temperature, means for developing a small direct current component from the applied alternating current and introducing said direct current component into the circuit of said motor winding along with said alternating current, and means responsive to said direct current component for determining the resistance of the winding.

4,083,002

METHOD AND APPARATUS FOR MEASURING CROSS SECTIONAL AREA AND WEIGHT PER UNIT LENGTH OF ELONGATED, CONDUCTIVE MATERIAL BY MAGNETIC FIELD DISPLACEMENT

John J. Allport, 12298 Candy Ct., Saratoga, Calif. 95070

Filed Feb. 17, 1976, Ser. No. 658,247
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—227 **11 Claims**



1. Apparatus for determining instantaneous cross sectional area of moving elongated, conductive material comprising,

first solenoid means axially surrounding a length of elongated, conductive material for generating an alternating magnetic field parallel to the length of the material, said field having a first frequency and a second, different frequency such that said field is substantially restrained from penetrating said material at selected material temperatures,

at least one second solenoid means within said first solenoid means axially surrounding said material for sampling said magnetic field generated by said first solenoid means and producing a first output signal representative of said magnetic field through said second solenoid when said material is respectively removed and inserted axially into said second solenoid means and

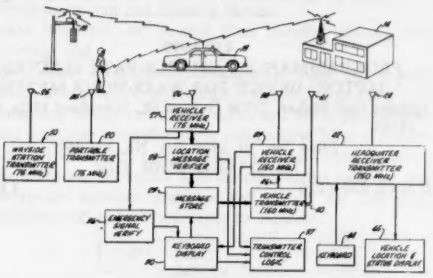
a processor module means connected to said second solenoid means for computing the ratio of said first output signal induced in said second solenoid means when said material is present in said second solenoid with a second signal induced in said second solenoid means when said material is absent in an area determining comparison relying on magnetic field displacement caused by the presence and absence of said material in said field, said processor means computing material cross sectional area at first and second frequencies for obtaining a true material cross sectional area independent of temperature.

4,083,003

VEHICLE LOCATION SYSTEM

Adrian B. Haemmig, Silverado, Calif., assignor to Products of Information Technology, Inc., Costa Mesa, Calif.

Division of Ser. No. 413,039, Nov. 5, 1973, Pat. No. 3,984,807.
This application Apr. 8, 1976, Ser. No. 675,031
Int. Cl.[2] G08G *1/12;* H04B *1/00*
U.S. Cl. 325—6 **2 Claims**



1. In a vehicle location system wherein stationary wayside stations at field locations are used to reference the field location of said vehicle at a given point in time and wireless paths are used for transmitting digitally encoded messages between said stationary wayside stations and said vehicle, the improvement comprising:

a radio transmitter located at said field location for re-transmitting said digitally encoded message over a radio channel from said field location to a remote site,

transmitter control means located at said field location for automatically turning on said radio transmitter upon receipt of said digitally encoded message over said wireless path,

a radio receiver located at said field location and tuned to the channel over which said messages are transmitted from said field location to said remote site, and

means located at said field location and responsively coupled to said receiver and operatively coupled to said transmitter control means for automatically delaying transmission of said encoded message to said remote site until said channel is clear so that simultaneous automatic transmissions on the same radio frequency channel are avoided.

4,083,004

EXPENDABLE REPEATER EMPLOYING HARMONIC MIXING

Marvin Cohn, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 8, 1976, Ser. No. 693,987
Int. Cl.[2] H04B *7/14*
U.S. Cl. 325—6 **11 Claims**

1. A signal repeater for providing a transmitted signal in response to a received signal, said repeater comprising:

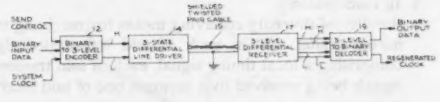
an oscillator for providing a heterodyning signal;
means for down-converting the received signal by mixing the received signal with a harmonic of the fundamental heterodyning signal of said oscillator to provide an intermediate frequency signal;
means for delaying the propagation of said intermediate frequency signal for a predetermined time;
means for up-converting the intermediate frequency signal by mixing the intermediate frequency signal with a harmonic of the heterodyning signal of said oscillator to provide the transmitted signal having a frequency which is substantially equal to the frequency of the received signal; and
means for switching the heterodyning signal of said oscillator between said down-converting means and said up-converting means in response to the propagation of said intermediate frequency signal between said down-converting means and said up-converting means.

4,083,005

THREE-LEVEL SERIAL DIGITAL DATA COMMUNICATION SYSTEM

Floyd William Looschen, Laguna Beach, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 1, 1976, Ser. No. 737,732
Int. Cl.[2] H04L *3/00*
U.S. Cl. 325—38 A **10 Claims**



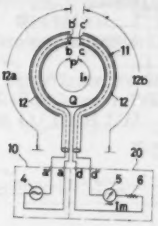
1. A serial three-level digital data communication channel comprising:
a two-wire transmission line;
encoding and driving means for encoding a binary input signal into a three-level signal having high, low and intermediate levels and for coupling said three-level signal to one end of said transmission line for transmission thereby, said encoding being such that one binary digit is encoded as a transition of two levels in a direction toward said high level if the previous level of said three-level signal is at said low level or by a transition of one level in a direction toward said low level if the previous level is at either said high or intermediate level, and the other binary digit is encoded as a transition of two 1 levels in a direction toward said low level if the previous level of said three-level signal is at said high level or by a transition of one level in a direction toward said high level if the previous level of said three-level signal is at either said low or intermediate level;
receiving and decoding means coupled to the other end of said transmission line for receiving the transmitted three-level signal, deriving a clock signal therefrom, and then employing the derived clock signal for decoding the received three-level signal into binary form.

4,083,006

LOOP TYPE STANDARD MAGNETIC FIELD GENERATOR

Ichiro Yokoshima, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 487,198, Jul. 10, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,769
Claims priority, application Japan, Jul. 10, 1973, 48-77091; Jul. 28, 1973, 48-84578
Int. Cl.[2] H04B *1/04*
U.S. Cl. 325—125 **8 Claims**



1. A loop type standard magnetic field generator comprising:
a loop having two paired signal feeding points formed by cutting away a portion thereof;
a two-wire feeding line, one end of each wire of said feeding line being connected to one end of one of said paired signal feeding points of said loop;
a signal generation circuit, a first terminal of said signal generation circuit being connected to the other end of one wire of said feeding line and a second terminal of said signal generation circuit being connected to the other end of the other wire of said feeding line and composed of an oscillator supplying a signal to said loop to generate a loop current;
a two-wire transmission line, one end of each wire of said transmission line being connected to the other end of the other of said paired signal feeding points of said loop;
a compensation circuit composed of a compensation resistor and an indicator for measuring the loop current supplied from said signal generation circuit, a first terminal of said compensation circuit being connected to the other end of one wire of said transmission line;
one end and the other end of the other wire of said transmission line being respectively connected to the one end of the other wire of said feeding line and to a second terminal of said compensation circuit;
the length of said transmission line and the resistance value of said compensation resistor being selected so that the frequency characteristic of a ratio of the indicated value of said indicator to the loop current flowing through said loop is cancelled by the frequency characteristic of a ratio of the loop current to a magnetic field strength at a given point.

4,083,007

RADAR TRANSMITTER TEMPORAL NOISE REDUCTION SYSTEM

Arnold M. Levine, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

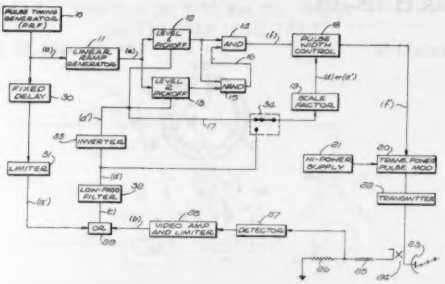
Filed Sep. 20, 1976, Ser. No. 724,278
Int. Cl.[2] H03K *13/02*
U.S. Cl. 325—159 **10 Claims**

1. A pulsed radar transmitting system, including a timing pulse source operating at a predetermined pulse repetition frequency, a pulse modulator controlled by said timing pulse source, a radio frequency transmitter pulsed by said modulator, to produce a corresponding radio frequency pulse and a power supply having ripple frequency components in its output, said

power supply being connected as the power source for said pulse modulator, comprising:

first means responsive to said timing pulse source and preceding said pulse modulator for providing a time position controlled initiating pulse to said pulse modulator, said first means being also responsive to a first control signal therefor;

second means for sampling said radio frequency pulse generated by said transmitter and for producing a video pulse



substantially in time coincidence with the envelope of said radio frequency pulse;

and third means responsive to said video pulse and said timing pulse for generating said first control signal as a function of the difference of starting time and duration between said video pulse, and for applying said first control signal to said first means in a polarity so as to vary the position of said initiating pulse to tend to compensate for variations in the time of occurrence of said radio frequency pulse.

4,083,008

METHOD AND CIRCUIT FOR GENERATION OF DIGITALLY FREQUENCY-SHIFTABLE ELECTRIC SIGNALS

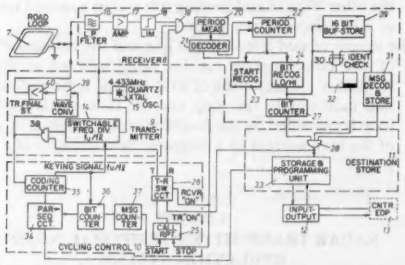
Bernd Eschke, Detfurth, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed Apr. 9, 1976, Ser. No. 675,318

Claims priority, application Germany, Apr. 10, 1975, 2515660; Apr. 14, 1975, 2516242

Int. Cl.[2] H04B *1/04*

U.S. Cl. 325—163 **22 Claims**



18. A method of generating frequency-shift code signals for a system for automatic exchange of coded information, with an oscillator shiftable between predetermined frequencies, a repetitive function generator circuit and an output stage, comprising the steps of:

generating electrical digital signals by means of said oscillator at at least two predetermined frequencies in a sequence of single-frequency emissions;

producing, by using current from a direct current source, in said function generator circuit, in response to said digital signals, a repeated stepped wave formed of a succession of intervals of a constant non-zero voltage level of the same polarity of which the highest and the lowest levels are maintained for twice as long as each of the others and the different voltage levels succeed each other in steps alternately rising from the lowest to the highest and descending from the highest to the lowest;

reversing the polarity of the wave produced in the preceding step at the middle of each interval of said lowest voltage level to produce an output wave;

filtering the wave produced in the preceding step to smooth out the stepped structure, and

shifting the frequency at which said electrical digitalsignals are generated from time to time but only at times coinciding with a polarity reversal which reverses the polarity of said output wave in a predetermined sense.

4,083,009

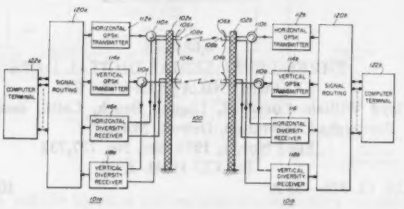
HIGH RELIABILITY DIVERSITY COMMUNICATIONS SYSTEM

William J. Bickford, Weston; William L. Hatton, Wellesley Hills; Colin J. Pallemaerts, Dover; Paul J. Tanzi, Wayland, and Carson K. H. Tsao, Middlesex, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 483,756, Jun. 27, 1974, abandoned. This application Jun. 4, 1976, Ser. No. 693,251

Int. Cl.[2] H04B *1/06, 7/02*

U.S. Cl. 325—304 **17 Claims**



1. In combinaton:

a plurality of diversity receiving means for receiving transmitted digital signals, each of said transmitted signals comprising a local timing signal, each of said transmitted signals being received by a separate one of said receiving means;

means for producing a composite timing signal from the received local timing signals; and

means for coupling a selected one of said diversity receiving means to utilizing means, selection of the said selected one of said receiving means occurring without loss of data to said utilizing means, said selection occurring in synchronism with a composite timing signal, transitions of said composite timing signal occurring at the average of the transition times of local timing signals at each of said receiving means.

4,083,010

RECEIVING MEANS FOR USE IN A DIGITAL DATA COMMUNICATION SYSTEM

Floyd William Looschen, Laguna Beach, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 1, 1976, Ser. No. 737,730

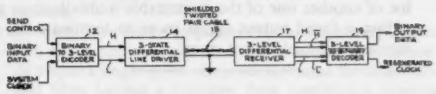
Int. Cl.[2] H04L *25/40*

U.S. Cl. 325—321 **7 Claims**

1. A balanced differential receiver for use in receiving a digital signal from a two-wire transmission line, said receiver comprising: first and second differential amplifiers each having positive and negative

differential inputs and each providing a binary output signal;

means coupling one input of said first differential amplifier to one wire of
said two-wire transmission line and coupling a like polarity input of
said second differential amplifier to the other wire of said two-wire transmission line;
first and second biasing means respectively coupled between

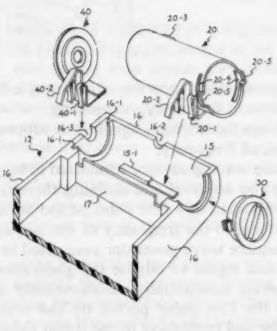


opposite polarity inputs of said first and second differential amplifiers; and
constant current means for applying a constant current to each of said biasing means, said constant current being chosen in conjunction with said biasing means for providing thresholds for said differential amplifiers for detecting a plurality of levels of a digital signal received from said transmission line.

4,083,011
BATTERY HOLDER AND CONNECTOR FOR A RADIO RECEIVER OR THE LIKE

Sherwood W. Ferrell, Rustburg; Friedrich H. Mann, and Henry A. Schaefer, both of Lynchburg, all of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jul. 26, 1976, Ser. No. 708,866
Int. Cl.² H04B *1/03*
U.S. Cl. 325—352 **10 Claims**



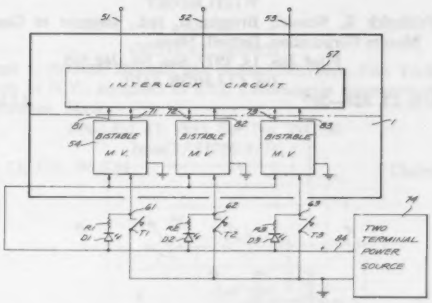
1. In a radio receiver or the like, an improved arrangement for removably holding and connecting a battery for powering said radio receiver or the like comprising:

a. an elongated member for receiving and holding a battery;
b. said elongated member comprising a metallic portion having retaining means at one end thereof;
c. first metallic means fastened to said metallic portion of said elongated member for attaching said elongated member to a radio receiver or the like, and for connecting said metallic portion to said radio receiver or the like;
d. a closure plate comprising a metallic portion having means for engaging said retaining means of said elongated member and removably attaching said closure plate to said elongated member, said closure plate extending across said one end of said elongated member for retaining said battery therein, said metallic portion of said closure plate being configured to engage one terminal of said battery at one end thereof and to connect said one terminal of said battery to said first metallic means fastened to said metallic portion of said elongated member;
e. a metallic contact;
f. and second metallic means fastened to said contact for attaching said contact to said radio receiver or the like and for connecting said metallic contact to said radio receiver or the like, said metallic contact being positioned in the vicinity of the other end of said elongated member so that the other end and the other terminal of said battery engages said metallic contact when said battery is positioned within said elongated member and retained by said closure plate.

4,083,012
AUTOMATIC FUNCTION SETTING AND INDICATION ARRANGEMENT FOR A COMMUNICATIONS RECEIVER

Willy Kanow, Berlin, Germany, assignor to Loewe-Opta GmbH, Kronach, Germany

Filed Feb. 10, 1977, Ser. No. 767,377
Claims priority, application Germany, Feb. 17, 1976, 2606227
Int. Cl.² H03H *5/12*
U.S. Cl. 325—455 **5 Claims**



1. An arrangement connectable to a two-terminal power source for simultaneously (a) providing an activating signal for a selected one of first and second functional settings in a communications receiver, (b) providing a visual indication of the selected setting and (c) disabling any activating signal and visual indication then present for the non-selected setting, the arrangement comprising, in combination, first and second selection keys, first and second electrically activated illuminating means, first and second bistable multivibrators each having a first switching terminal and a complementary second switching terminal, the respective first ones of the keys, illuminating means and multivibrators being individually associated with the first setting and the respective second ones of the keys, illuminating means and multivibrators being associated with the second setting, means associating each of the multivibrators with a first terminal of the power source for establishing a relatively low impedance between the first switching terminal of the multivibrator and the first terminal of the power source upon the application of a prescribed switching voltage to the first switching terminal of the multivibrator and for establishing a relatively high impedance between the first switching terminal and the first terminal of the power source upon the application of the switching voltage to the second switching terminal of the multivibrator, means for individually coupling each illuminating means between the other terminal of the power source and the first switching terminal of the associated multivibrator, means individually connecting each key between the first terminal of the source and the first switching terminal of the associated multivibrator for simultaneously applying the switching voltage to the first switching terminal of the associated multivibrator and for activating the associated illuminating means when the key is actuated, first and second gating means each having a trigger input and at least first and second outputs which are actuated in parallel when the trigger input thereof is excited, the first output of each gating means exhibiting the switching voltage when the associ-

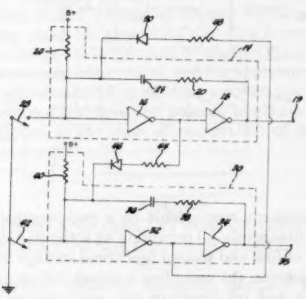
ated trigger input is excited, means coupling the second switching terminal of the first multivibrator to the trigger input of the first gating means for exciting said trigger input when the switching voltage is applied to the first switching terminal of the first multivibrator, means coupling the second switching terminal of the second multivibrator to the trigger input of the second gating means for exciting said trigger input when the prescribed switching voltage is applied to the first switching terminal of the second multivibrator, means for coupling the first output of the first gating means to the second switching terminal of the second multivibrator, and means for coupling the first output of the second gating means to the second switching terminal of the first multivibrator, the second outputs of the first and second gating means individually constituting the activating signals for the first and second settings, respectively.

4,083,013

MONOSTABLE MULTIVIBRATOR TIMER CIRCUITS WITH RESET

Frederick K. Schultz, Bringhurst, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1977, Ser. No. 760,565
Int. Cl.² H03K *3/10*
U.S. Cl. 328—207 **2 Claims**



1. A system for selectively providing a timed output signal at one of at least two output terminals characterized in that selectively providing a timed output signal at one of the output terminals is effective to terminate an existing timed output signal at the remaining output terminals, the system comprising:

a voltage source, the low voltage side of the voltage source defining a point of reference potential:

at least first and second monostable multivibrators, each of said multivibrators including amplifying means having an input terminal, a noninverting output terminal and an inverting output terminal, a timing capacitor coupled between the input terminal and the noninverting output terminal, a timing resistor coupled between the high voltage side of the voltage source and the input terminal, the noninverting output terminal being normally set by the voltage source to a high voltage and the inverting output terminal being normally set by the voltage source to the reference potential, and a selectively operable switch means effective when operated to apply a reference potential pulse to the input terminal so as to shift the noninverting output terminal from the high voltage to reference potential and shift the inverting output terminal from the reference potential to the high voltage, said noninverting and inverting output terminals remaining at the reference potential and high voltage, respectively, during the period of the reference potential pulse and thereafter for a specified time duration determined by the time constant of the timing capacitor and the timing resistor to provide the timed output signal at the inverting and noninverting output terminals; and

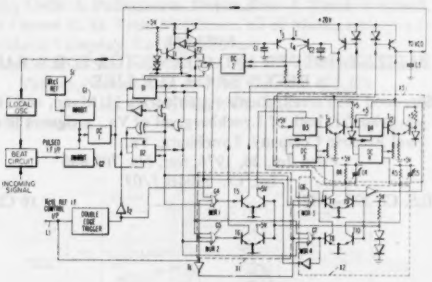
circuit means coupled between the inverting output terminal of the amplifying means in each of the monostable multivibrators to the input terminals of the remaining ones of the monostable multivibrators so that selective operation of a switch means associated with one of the monostable multivibrators is effective to quickly charge the timing capacitor of another one of the monostable multivibrators providing a timed output signal so as to terminate the last mentioned timed output signal.

4,083,014

FREQUENCY LOCK LOOP

Ashley W. Guest, Bristol, England, assignor to British Aircraft Corporation Limited, London, England

Filed Oct. 12, 1976, Ser. No. 731,860
Claims priority, application United Kingdom, Oct. 17, 1975, 42615/75
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **6 Claims**



1. A frequency lock loop for adjusting the frequency of a signal to a desired frequency, comprising:

storage means for storing a signal value representative of the said desired frequency;

a first square wave generator connected to be clocked by the signal to be adjusted and defining thereby the initiation and termination of a first pulse period which is inversely proportional to the frequency of the said signal;

a second square wave generator connected to be responsive to the said signal to initiate the generation of a second pulse period substantially simultaneously with the initiation of the first pulse period by the first square wave generator and responsive to the signal value stored by the storage means to terminate the said second pulse period after an interval, from its initiation, inversely proportional to the said desired frequency;

a comparator for comparing the first and second pulse periods defined by the first and second square wave generators to derive a correcting signal varying with the difference in the durations of the said pulse periods; and

a feedback circuit responsive to the said correcting signal for adjusting the frequency of the said given signal in a sense such as to reduce the difference in the durations of the two said square waves.

4,083,015

FAST SWITCHING PHASE LOCK LOOP SYSTEM

Alfred E. Popodi, Glen Burnie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 678,802, Apr. 21, 1976, abandoned. This application Jul. 22, 1977, Ser. No. 817,931
Int. Cl.² H03B *3/04*
U.S. Cl. 331—4 **6 Claims**

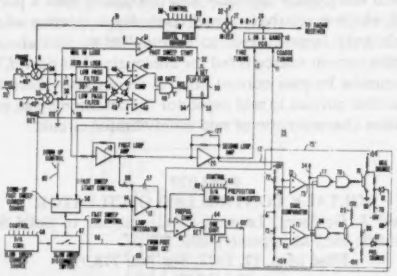
1. A phase lock loop system for decreasing the phase settling time for phase coherency with a reference frequency immedi-

ately after lock when switching from one desired frequency to another desired frequency, comprising:

a voltage controlled oscillator for generating at its output a frequency signal that varies as a function of its input voltage;

phase comparator means to generate at its output an alternating output signal that decreases in frequency to provide a frequency modulation ramp as the difference between the oscillator frequency and the reference frequency decreases;

a low pass filter means responsive to the frequency modulation of the phase comparator means output to generate at its output a single pulse of a predetermined theshold value, said filter having a response time matching a predetermined frequency modulation rate of the phase comparator means output such that the duration of one period of the filter cut-off frequency is substantially equal to the duration of the predetermined frequency modulation rate of the phase comparator means to generate said single pulse



at a precise time substantially in the center of the capture range,

tuning loop means when connected coupling electrically the output of the phase comparator means to the input of the oscillator, said tuning loop means also including means operative to generate a constant voltage output when the phase comparator means output is at zero error potential to lock the phase of the oscillator frequency to the phase of the reference frequency;

a normally inactive current sweep source operative when activated to change the input voltage to the oscillator at a predetermined rate to provide such predetermined frequency modulation rate at the output of the comparator means;

first circuit means responsive to a change to a desired frequency to activate the current sweep source and disconnect the tuning loop means from the oscillator input; and

second circuit means responsive to said single pulse to deactivate the current sweep source and connect the tuning loop means to the oscillator substantially simultaneously.

4,083,016

COUPLED-CAVITY MICROWAVE OSCILLATOR

Donald Roy Zangrando, Los Altos, Calif., and Clifford Herrol Kelley, Jr., San Jose, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

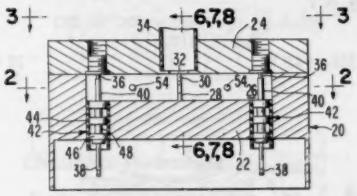
Filed Dec. 27, 1976, Ser. No. 754,867
Int. Cl.² H03B *7/14, 9/12*
U.S. Cl. 331—56 **18 Claims**

1. An oscillator comprising:

a conductive cavity resonator structure comprising two resonant hollow cavities electromagnetically coupled together by a coupling iris in a common wall separating said cavities,

two equal sets of negative-resistance semiconductive devices, each of said sets being coupled to the electromagnetic field in a separate one of said cavities,

each of said devices having a first and second terminal for connection to a source of dc bias, means for applying dc bias to said devices comprising conductive lead means insulated from said cavity resonator structure connecting to said first terminal of each device, and



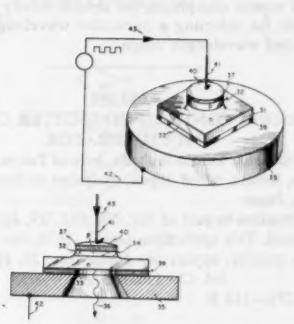
means for coupling electromagnetic energy from said cavities into a useful load, said means for coupling comprising an output iris overlaying said coupling iris, said output iris coupling into an output waveguide.

4,083,017

OPTICAL MASER

Joseph L. Birman, Bayside, and Sumner Mayburg, New York, both of N.Y., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 12, 1963, Ser. No. 294,766
Int. Cl.² H01S *3/19*
U.S. Cl. 331—94.5 H **2 Claims**



1. An optical maser comprising

a. an optical cavity formed from a wafer of gallium arsenide having first and scond contiguous *p* and *n* type regions with resistivities in the range 10^{-3} to 10^{-1} ohm-centimeter, said *p* region being centrally located and having an area less than the area of said *n* region, the surfaces of said *n* region remote from and opposite said *p* region being parallel to said *p* region and optically flat,

b. a first metallic layer secured directly to the *n* region of said wafer on the surface remote from said *p* region, said first metallic layer being in ohmic contact with said *n* region and surrounding the optically flat portion of said *n* region,

c. a second metallic layer secured directly to the *p* region of said wafer and being in ohmic contact therewith,

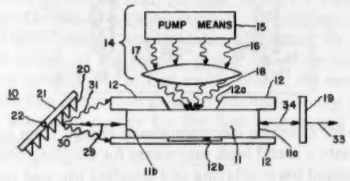
d. first and second electrodes attached to said first and second metallic layers respectively, and

e. means for producing a current through said optical cavity having a direction of flow from the *p* to the *n* region and having a magnitude sufficient to produce stimulated emission, coherent radiation being emitted from the optically flat portion of the *n* region of said gallium wafer in a direction perpendicular to the boundary between said contiguous *p* and *n* regions.

4,083,018
TUNABLE LASER SYSTEM

Kei-Hsiung Yang, Schenectady, and John A. De Luca, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1976, Ser. No. 703,093
Int. Cl.[2] H01S 3/16
U.S. Cl. 331—94.5 F 21 Claims



1. A laser system tunable over one of a plurality of wavelength ranges in the overall wavelength range of about 1650 angstroms to about 3300 angstroms, comprising:

a crystal of a host material containing the fluoride of at least a column IIIb metal and having the lattice thereof activated by at least one lanthanide-series element;

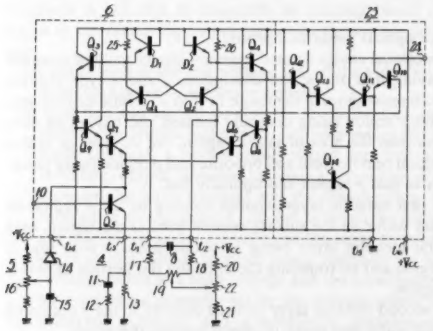
excitation means for pumping said crystal with energy having wavelengths of about 1600 A in the vacuum-ultraviolet region of the electromagnetic spectrum to cause said crystal to fluoresce over the selected one of said plurality of wavelength ranges; and

optical means comprising an optical cavity and including means for selecting a particular wavelength within said selected wavelength range.

4,083,019
CURRENT CONTROLLED EMITTER COUPLED MULTIVIBRATOR

Takeshi Hamada; Yoshio Ishigaki, both of Tokyo, and Masayuki Hongu, Komae, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 542,719, Jan. 21, 1975, abandoned. This application Dec. 1, 1976, Ser. No. 546,757
Claims priority, application Japan, Jan. 29, 1974, 49-12393
Int. Cl.[2] H03K 3/282, 7/06
U.S. Cl. 331—113 R 14 Claims



1. A circuit comprising a frequency controllable multivibrator comprising:

A. first and second transistors each including a base electrode, an emitter electrode and a collector electrode, said collector electrodes of said first and second transistors being coupled to said base electrodes of said second and first transistors, respectively;

B. voltage supply means for supplying a voltage;

C. first and second load elements connecting respective ones of said collector electrodes of said first and second transistors to said voltage supply means;

D. a capacitor connected between said emitter electrodes of said first and second transistors for enabling conduction of the latter alternately;

E. a pair of current controlling devices each including input, output and common electrodes, said input and output electrodes of each of said pair of current controlling devices being connected respectively to said collector and emitter electrodes of a respective one of said first and second transistors for controlling said devices with output signals of said first and second transistors;

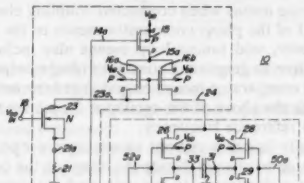
F. a common main current source connecting said common electrodes of said pair of current controlling devices to said voltage supply means and through which a relatively large main current is fed from said pair of current controlling devices alternately; and

G. a common by-pass current control means connected to each side of said capacitor and through at least a portion of which a relatively small controllable portion of said relatively large current to be supplied to said common main current source is fed for minimizing lost power, said common by-pass current control means also controlling another current to said capacitor for determining an oscillation characteristic of said multivibrator circuit.

4,083,020
VOLTAGE CONTROLLED OSCILLATOR

Mitchell J. Goldberg, Lansdale, Pa., assignor to Solid State Scientific Inc., Montgomeryville, Pa.

Filed Mar. 17, 1977, Ser. No. 778,796
Int. Cl.[2] H03K 3/282
U.S. Cl. 331—113 R 13 Claims



1. A voltage controlled oscillator whose frequency is a function of an input voltage comprising

means for supplying current of value which is a function of said input voltage,

a storage device having a first and a second terminal,

a first and a second pair of switching devices coupled respectively to said first and second terminals of said storage device, each pair having a first and a second switching device, one terminal of each of said first switching devices being connected to said current supplying means and one terminal of each second switching device being connected to a reference potential,

first and second cross-connected gating devices,

first and second inverter means coupled respectively be-

tween said first and second storage device terminal and an input of said first and second gating devices,

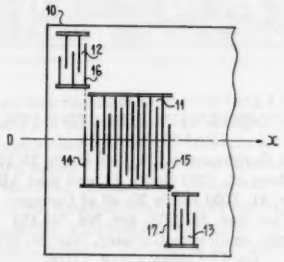
third and fourth inverter means coupled between an output of said first and second gating devices respectively and an input of said first and second pair of switching devices for controlling said switching devices to couple one of said storage device terminals to said current supplying means and the other storage device terminal to said reference potential and upon state transition to first couple said one storage device terminal to said reference potential before switching said other storage device terminal to said current supplying means.

4,083,021

TRANSDUCER FOR SURFACE WAVE FILTERS WITH REDUCED DIFFRACTION

Jean Michel Autran, and Bernard Epsztein, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 12, 1976, Ser. No. 731,651
Claims priority, application France, Oct. 17, 1975, 75 31901
Int. Cl.² H03H *9/04, 9/26, 9/32;* H01L *41/10*
U.S. Cl. 333—72 **5 Claims**



1. A transducer for a surface wave filter with a transfer function T(F) of which the inverse Fourier transform is a function I(*t*) having maxima of which the amplitudes vary within wide limits, comprising at least two elemental transducers with interdigital electrodes disposed on a common piezoelectric substrate so as to transmit, acoustic waves along two parallel propagation paths, the first of these two transducers having a pulse response $I_1(t)$ comprising the high-amplitude maxima of the function I(*t*) and being fed by the high-frequency signal to be filtered, and the second of these two transducers having a pulse response $I_2(t)$ comprising maxima equal to *n* times the low-amplitude maxima of the function I(*t*) and being fed by a signal equal to the 1/*n* of said signal to be filtered, the two said elemental transducers being staggered in the propagation direction Ox of the waves which they transmit in such a way that the maxima of their respective pulse responses are disposed along the time axis, as are the maxima of I(*t*).

4,083,022

PLANAR PI MULTI-FILTER HAVING A FERRITE INDUCTANCE FOR PIN FILTERS IN ELECTRICAL CONNECTORS

John Peter Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 12, 1976, Ser. No. 731,125
Int. Cl.² H03H *7/04, 13/00;* H01R *17/10, 13/66*
U.S. Cl. 333—79 **14 Claims**

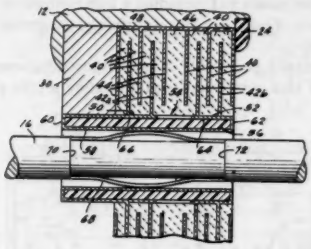
4. An electrical connector assembly comprising:

a metal connector shell;

a dielectric member carried in said shell and including at least one contact passageway extending therethrough;

an electrical contact extending through and mounted in said passageway;

an inductance within said shell surrounding and electrically connected to said electrical contact; and



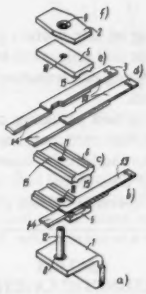
a pair of planar capacitances each including radially extending plates surrounding said inductance, each said capacitance electrically connected between a respective end of said inductance and said shell to form a pi filter.

4,083,023

CONTACT SPRING PILE-UP ASSEMBLY

Iosif Semenovich Cherny, ulitsa Zernovaya 6/1, kv. 85, and Mikhail Vasilievich Mischenko, ulitsa Kirgizskaya 5a, kv. 3, both of Kharkov, U.S.S.R.

Filed Apr. 5, 1976, Ser. No. 673,477
Claims priority, application U.S.S.R., Apr. 7, 1975, 2122529
Int. Cl.² H01H *63/10*
U.S. Cl. 335—135 **3 Claims**



1. A relay contact pile-up assembly comprising: metallic fastenings with holes; contact springs placed between said fastenings; plates of thermoplastic material provided with holes and having projections running the length of the surface facing said contact springs, said plates insulating said contact springs from one another; a bush extending through said holes in said fastenings and said plates and connecting all said parts of the assembly; the height of said projections being chosen so that when the assembly is compressed in the process of assembly, said contact springs are depressed against said projections until they come in contact with the surface of said plate.

4,083,024

MINIATURE RELAY

Jack T. Rover, Boring, Oreg., assignor to Datron Systems, Inc., Thomaston, Conn.

Filed Oct. 7, 1976, Ser. No. 730,338
Int. Cl.² H01H *51/02*
U.S. Cl. 335—136 **8 Claims**

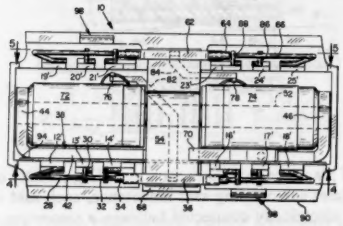
1. A miniature relay comprising:

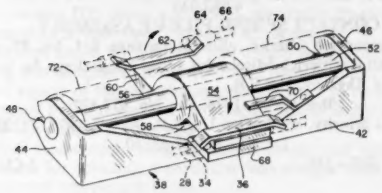
a pair of actuating coils each provided with magnetically permeable core means,

a rotatable armature formed of magnetically permeable

material and positioned between first ends of said core means to form a magnetic circuit therewith, said armature being rotatable about a fixed axis joining said first ends of said core means and including a hub contiguous with said first ends of said core means forming a magnetic extension thereof,

a magnetically permeable frame disposed between second ends of said core means and providing a pole piece, said





armature including an arm portion joined to said hub and extending adjacent said pole piece to be attracted by said pole piece for rotating said armature when said operating coils are energized,

means for energizing said actuating coils to provide magnetic flux through said core means and said frame in opposite directions for additively combining between said armature and said pole piece,

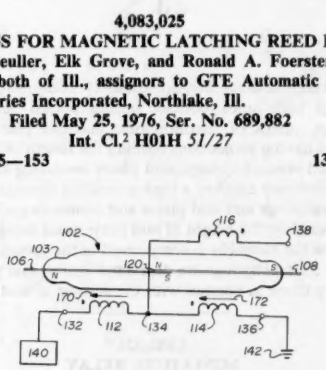
and contact means operated by said armature.

4,083,025

WINDINGS FOR MAGNETIC LATCHING REED RELAY

Von W. Meuller, Elk Grove, and Ronald A. Foerster, Carol Stream, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 25, 1976, Ser. No. 689,882
Int. Cl.[2] H01H *51/27*
U.S. Cl. 335—153 **13 Claims**



1. A relay having a pair of remanently magnetic members with free ends movable with respect to each other to close an electrical path when the members are each magnetized in the same direction and to open the electrical path when the members are each magnetized in an opposite direction, comprising:

first means for establishing a first magnetic direction with respect to a first one of the members;

second means for establishing the first magnetic direction with respect to a second one of the members;

third means for establishing a second magnetic direction with respect to the second member, the second magnetic direction being opposite from the first magnetic direction;

said second means being selectively energizable with said first means so that a first single concurrent application of energy only to said first and said second means produces said first magnetic direction with respect to the first and second members thereby causing the first and second members to attract and close the electrical path; and

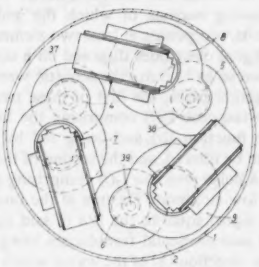
said third means being selectively energizable with said first means so that a second single application of energy only to said first and said third means produces the first magnetic direction with respect to the first member and the second magnetic direction with respect to the second member thereby causing the first and second members to release and open the electrical path.

4,083,026

ARRANGEMENT WITH INDUCTIVE VOLTAGE TRANSFORMERS

Gerhard Kleen, Burgfrauenstr. 79, 1000 Berlin 28; Heinz Schiemann, Quellweg 38, 1000 Berlin 13, and Karl Allmendinger, Altonaer Str. 41, 1000 Berlin 20, all of Germany

Filed Nov. 22, 1976, Ser. No. 744,158
Claims priority, application Germany, Nov. 28, 1975, 2554142
Int. Cl.[2] H01F *15/14, 27/00*
U.S. Cl. 336—70 **13 Claims**



1. A transformer arrangement comprising:

a plurality of inductive voltage transformers within a metal capsule, each of which comprises:

an insulating body having a high potential winding disposed therein;

and a bushing laterally joined to said insulating body;

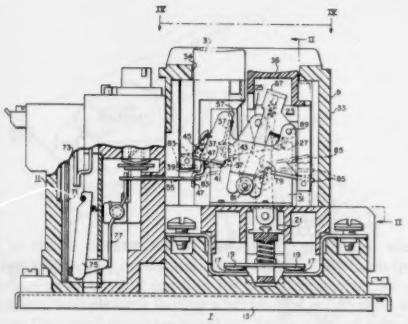
the bushing of each of said voltage transformers having a high voltage conductor therein; said bushings extending through said capsule in a substantially parallel arrangement;

and the remaining portion including the insulating body of each one of said voltage transformers being arranged in a space defined by the bushing corresponding to that one transformer, the bushing following said corresponding bushing in the circumferential direction and included in the voltage transformer adjacent said one voltage transformer, and by the area between said corresponding and following bushings which lies adjacent said capsule.

4,083,027
PUSHBUTTON ELECTRIC SWITCH

Stephen S. Dobrosielski, Beaver; Edward L. Richards, Aliquippa, and Paul Skalka, Beaver, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 634,729, Nov. 24, 1975, abandoned, which is a continuation of Ser. No. 573,370, Oct. 9, 1974, abandoned. This application Jan. 6, 1977, Ser. No. 757,547
Int. Cl.² H01H *71/16*
U.S. Cl. 337—66 7 Claims



1. A circuit interrupting device comprising a switch mechanism, a frame, and an electrically insulating housing therefor, the switch mechanism comprising relatively movable contacts and operating means for moving the contacts between open and closed positions, the operating means comprising an overcenter toggle and a switch lever, the overcenter toggle including a toggle spring, a releasable arm operable to effect tripping of the movable contacts, one end of the switch lever being pivotally mounted on the frame and the toggle spring being secured to the other end, one end of the releasable arm being pivotally mounted on the frame and movable between tripped and latched positions, a latch lever releasably connected to the other end of the releasable arm for retaining said arm in the latched position, means responsive to a current overload condition for actuating the latch lever to the tripped position, an operating lever pivotally mounted on the frame and secured to the switch lever, said housing having an opening, a first pushbutton extending through the opening and engaging the operating lever to move the contacts to the open position, and a second pushbutton extending through the opening and engaging the operating lever to move the contacts to the closed position.

4,083,028
PAD-MOUNTED DOUBLE-FUSED VACUUM SWITCHGEAR

Harold D. Haubein; George D. Allen; Robert W. Harmon; Edgar J. Ramsey, Jr., all of Centralia, and Ronald C. Pehle, Mexico, all of Mo., assignors to A.B. Chance Company, Centralia, Mo.

Filed Dec. 15, 1975, Ser. No. 640,916
Int. Cl.² H01H *71/20*
U.S. Cl. 337—144 13 Claims

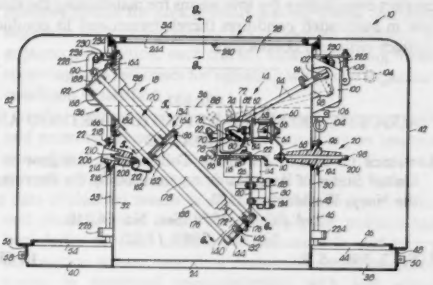
1. High voltage, double-fused switchgear apparatus, comprising:

a tank adapted to hold a supply of fluid dielectric material;

a switch element positioned within said tank below the normal level of dielectric therein and including separable electrical contacts and mechanism for selectively opening and closing the contacts for interrupting and establishing a current path through the switch element as desired;

a fuse assembly including a current limiting fuse, an expulsion-type fuse link, and means electrically connecting the fuse link and current limiting fuse in series;

means for mounting said fuse assembly in series with said switch element in said tank below the normal dielectric

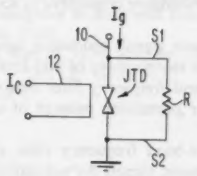


level therein and in relatively close physical proximity to the switch element.

4,083,029
THIN FILM RESISTORS AND CONTACTS FOR CIRCUITRY

Syamal K. Lahiri, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 429,461, Dec. 28, 1973, Pat. No. 3,913,120. This application Jul. 28, 1975, Ser. No. 599,803
Int. Cl.² H01L *39/12*
U.S. Cl. 338—32 S 28 Claims

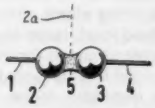


1. A circuit having a first conductor which contacts a second conductor of different composition, said first and second conductors being comprised of the same multi-component solid solution or compound, which exists as a stable phase in each of said conductors.

4,083,030
ELECTRIC HYGROMETER

Markus Gröninger, Neuenhof, Switzerland, assignor to Howag AG, Wohlen, Switzerland

Filed Oct. 14, 1976, Ser. No. 732,391
Claims priority, application Switzerland, Oct. 15, 1975, 13348/75
Int. Cl.² H01L *7/00*
U.S. Cl. 338—35 19 Claims



1. In an electric hygrometer, particularly for measurement of relative humidity of gaseous media, a combination comprising spaced-apart first and second conductors; a body of liquid hygroscopic electrolyte intermediate said conductors; and means for supporting the electrolyte in moisture-exchanging contact with a medium whose relative humidity requires determination and in conductive contact with said conductors

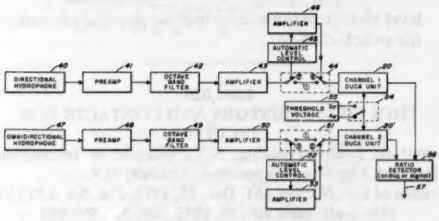
whereby the impedance between said conductors varies with relative humidity of said medium, said supporting means comprising a plurality of spaced-apart electrolyte carriers and said carriers constituting the sole means for maintaining the electrolyte in suspended condition therebetween and in conductive contact with said conductors.

4,083,031

ACOUSTIC PRESENCE DETECTION METHOD AND APPARATUS

Lawrence C. Pharo, Jr., State College, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 23, 1970, Ser. No. 64,910
Int. Cl.[2] G08B *13/00*
U.S. Cl. 340—5 R **12 Claims**



1. A passive acoustic detection system for detecting noise radiating devices in a noise environment comprising:

a first acoustic transducer responsive to acoustic signals in its environment;

a source of acoustic signals producing signals representative of noise in the environment of said first transducer;

a first octave-band frequency filter connected to said first transducer for permitting passage of only one band of frequencies;

a second octave-band frequency filter connected to said source of acoustic signals for permitting passage of only one band of frequencies;

a first automatic level control circuit responsive to the output signal from said first band filter to provide a constant root mean square level for the output signal from said first band filter;

a second automatic level control circuit responsive to the output signal from said second band filter to provide a constant root mean square level for the output signal from said second band filter;

a first pulse-forming clamp circuit, having a selectably variable threshold level, responsive to the output of said first level control circuit for providing a pulse whenever said threshold level is exceeded;

a first means responsive to the output of said first pulse-forming clamp circuit to provide a constant amplitude pulse signal every time said first pulse-forming circuit generates a pulse;

a second pulse-forming clamp circuit, having a selectable variable threshold level, responsive to the output of said second level control circuit for providing a pulse whenever said threshold level is exceeded;

a second means responsive to the output of said second pulse-forming clamp circuit to provide a constant amplitude pulse signal every time said second pulse-forming circuit generates a pulse;

a ratio detector responsive to the output of said first and second means for measuring the ratio of the pulses from said first means to the pulses from said second means;

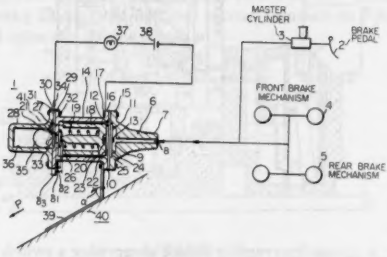
whereby a presence is detected if the ratio of pulses from said first means to said second means equals or exceeds a predetermined amount.

4,083,032

SPEED-DECELERATION WARNING SYSTEM FOR MOTOR VEHICLES

Hiroyuki Nakamura, Gotenba; Hiroshi Kawaguchi, and Kiyoshi Nishiwaki, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 462,381, Apr. 19, 1974. This application Mar. 8, 1976, Ser. No. 664,816
Claims priority, application Japan, Nov. 21, 1973, 48-130931
Int. Cl.[2] G08B *21/00*; B60Q *1/26*
U.S. Cl. 340—71 **11 Claims**



2. A braking deceleration warning system for installation in a motor vehicle having a source of electrical power and braking means actuated by fluid under pressure, the warning system comprising:

an electrically actuated device adapted to warn an operator of the vehicle of abnormal vehicle deceleration when the brakes are applied;

a first electrical contact;

a second electrical contact that is normally spaced out of electrical connection with the first contact;

means adapted to connect the first and second contacts in circuit with a source of electrical power and the warning device for actuating the warning device only in the event that the first contact makes electrical connection with the second contact;

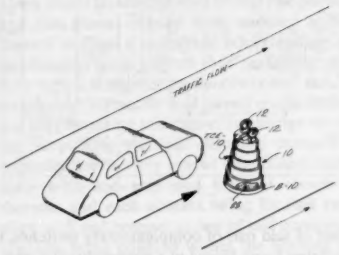
means connected to the first contact and adapted to be connected to the braking fluid system of a motor vehicle, said means being responsive to the pressure of the braking fluid for moving the first contact from a first position to a second position as the fluid pressure increases to above a predetermined pressure normally effective to produce a predetermined deceleration of the vehicle, the first contact being unable to make electrical connection with the second contact unless the first contact reaches at least said second position; and

means responsive to deceleration of the vehicle for moving the second contact away from an initial position if the resulting vehicle deceleration attains at least the predetermined deceleration corresponding to said predetermined braking fluid pressure, the second position of the first contact being electrically connected with the initial position of the second contact, such that the first contact will make electrical connection with the second contact if, and only if, the applied braking fluid pressure at least equals said predetermined normal pressure, and the resulting vehicle deceleration is less than a predetermined normal rate of speed reduction corresponding to the predetermined braking fluid pressure.

4,083,033
TRAFFIC CONTROL ELEMENT

Jack H. Kulp, San Juan Capistrano, Calif., and James M. Florsheim, Northbrook, Ill., assignors to Royal Industries, Inc., Pasadena, Calif.

Filed May 7, 1976, Ser. No. 684,448
Int. Cl.[2] E01F *9/00*; E04H *17/00*; G08B *23/00*
U.S. Cl. 340—114 R **50 Claims**

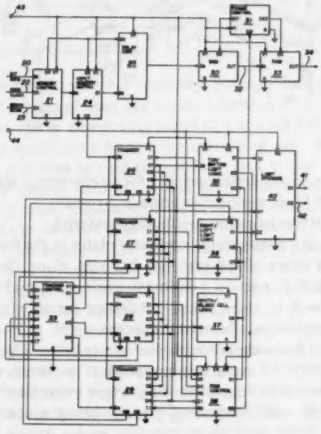


1. A traffic channelization element comprising an element having a D-shaped configuration for temporarily mounting on a surface in an upright position for traffic signaling and channelization, said element having a barrel-like appearance with a hollow D-shaped cross-sectional configuration and being constructed of a resilient plastic material and is defined to have a stepped configuration wherein the smaller dimension of the element is at the free end of the element when mounted in an upright position.

4,083,034
PLURAL TRACKER CHARACTER DETECTION AND BOUNDARY LOCATION SYSTEM

James Ray Hicks, Irving, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Oct. 4, 1976, Ser. No. 729,540
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 H **11 Claims**



1. A character detection and location system receiving a binary information stream from a sensor scanning characters printed on a document surface for centering valid character information in a memory mosaic, which comprises:

(a) data synchronization means receiving said binary information stream for synchronizing the information rate to the processing rate of said system;

(b) shift register memory means in electrical communication with said synchronization means for providing responses to said binary information stream passing through registration with selected memory cells;

(c) plural tracker means receiving said responses from said memory means for concurrently tracing plural character segments each comprised of said responses satisfying an adjacency condition, each tracker means including means receiving said responses for signaling when said adjacency condition is satisfied;

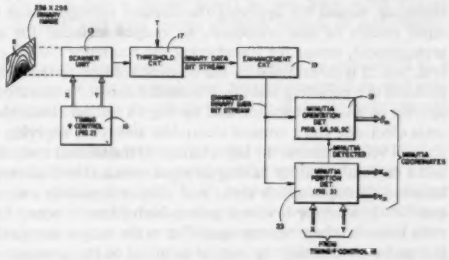
(d) tracker control means in electrical communication with said memory means for selectively activating an inactive one of said plural tracker means when one of said responses satisfies a start condition; and

(e) data evaluation means in electrical communication with said plural tracker means for detecting the position and boundaries of valid character information in said binary information stream, said data evaluation means including means in electrical communication with said plural tracker means for determining if a character segment represents valid character information.

4,083,035
BINARY IMAGE MINUTIAE DETECTOR

John P. Riganati, Yorba Linda, and Visvaldis A. Vitols, Orange, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 10, 1976, Ser. No. 722,307
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 E **6 Claims**



1. A machine method for detecting minutiae in two-dimensional binary data derived from a pattern image, said method comprising the steps of:

enhancing the binary data;

detecting the relative positions of minutiae in the enhanced binary data as a function of the relative locations of first preselected patterns of data in the enhanced binary data;

identifying ridge angle flow lines in the enhanced binary data as a function of the detection of second preselected patterns in the enhanced binary data;

determining the vector average of the ridge angle flow lines for each of a plurality of predetermined areas of the two-dimensional enhanced binary data in order to identify the orientation angle common to all of the minutiae detected in each said predetermined area; and

correlating the vector average of the ridge angle flow lines with the relative positions of minutiae in each corresponding predetermined area to derive the same relative orientation angle for each of the relative positions of minutiae in that corresponding predetermined area.

4,083,036
ARRANGEMENT FOR PRODUCING PULSE-SHAPED SIGNALS

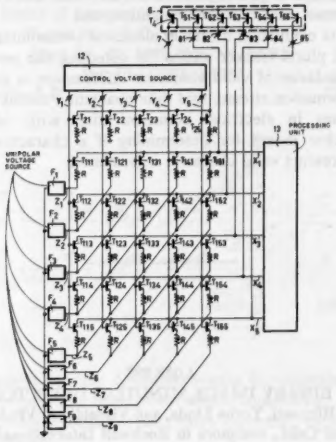
Johannes P. M. Bahlmann, and Wilhelmus A. J. M. Zwijsen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1976, Ser. No. 707,035

Claims priority, application Netherlands, Jul. 23, 1975, 7508772

Int. Cl.[2] G11C *7/00*

U.S. Cl. 340—166 R 14 Claims



1. An arrangement for producing pulse-shaped signals whose amplitude is determined by a control voltage, comprising a first transistor connected to operate as a current source and having an output electrode, a main electrode and a control electrode, means for applying the control voltage across the input circuit of said transistor, an output terminal for said arrangement, means for transferring the transistor output current, which is determined by the control voltage, to the output terminal in a pulsating fashion, a second transistor connected to operate as a current source and having an output electrode, a main electrode and a control electrode, means for applying the control voltage across the input circuit of the second transistor, and a current amplifier having an input terminal and an output terminal through which input and output terminals currents can flow in a mirror-inverted sense which currents bear a fixed ratio to each other, current amplifier to the output terminal of the means connecting the output terminal of the arrangement and also to the output electrode of one of said transistors, and means connecting the input terminal of the current amplifier to the output electrode of the other transistor.

4,083,037
DETECTION CIRCUIT

Larry D. Larsen, Palatine, Ill., assignor to Patent Development & Management Company, Elgin, Ill.

Filed Dec. 8, 1975, Ser. No. 638,843

Int. Cl.[2] G08B *17/10*

U.S. Cl. 340—237 S 21 Claims

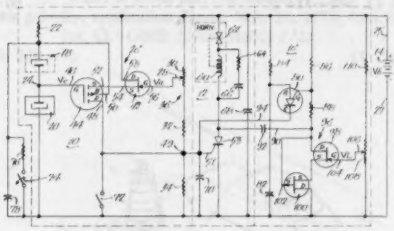
1. In a circuit having a source of power, a voltage divider connected across the power source having an output and a sensing element with an impedance variable in accordance with a phenomenon sensed thereby, variation of said impedance causing a corresponding variation in a sensing voltage at said output, a detection circuit, comprising:

a pair of complementary voltage-responsive switches each having a pair of transconductive terminals and a control terminal and being switchable between conductive and nonconductive states;

means for connecting the transconductive terminals in series across the power source;

means for applying a preselected detection voltage to the control input of one of said switches, said preselected voltage being proportional to the power source voltage;

means for applying the sensing voltage to the control input



of the other of said pair of complementary switches, both of said switches being biased in a nonconductive state and both of said switches assuming a conductive state when the sensing voltage value assumes a value substantially equal to said preselected detection voltage; and

means responsive to said switches assuming a conductive state for providing an indication of detection.

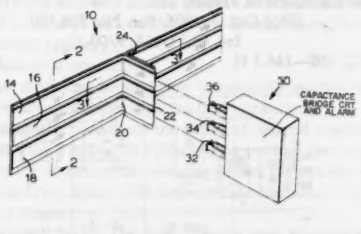
4,083,038
CONDENSER PLATE ASSEMBLY

Leonard Klebanoff, Willowdale, Canada, assignor to Elkay Electronics Ltd., Agincourt, Canada

Continuation-in-part of Ser. No. 584,741, Jun. 9, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,843

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—244 R 3 Claims



1. A condenser plate assembly for an electronic alarm circuit of a liquid level sensor comprising:

a web of flexible non-conducting material;

electrically conducting condenser plates in the form of elongated strips of foil material disposed along the length of the web in parallel relation to each other and secured to said web to form probe condenser means with an open dielectric space between adjacent strips;

said web and secured condenser plates being folded to cause a portion of each condenser plate to be in upstanding relation with respect to the portion immediately adjacent thereto, said upstanding portion being a connector tab; and

said web having an adhesive on the opposite face to said condenser plates and being mountable on the wall of a container for a flowable dielectric material.

2. An improved sensor and alarm device for sensing the level of a liquid in a non-conductive container, the device including a condenser plate assembly to be secured to the container for optimal capacitive coupling to its liquid contents and further including an electronic capacitive bridge circuit connectable to said condenser plate assembly and operative to actuate an

alarm circuit when the sensed level is reached by the liquid, the improvement comrpising:

in said condenser plate assembly a flexible web of non-conducting material having adhesive on one side for securing the web to follow the surface contour of the container, and multiple electrically conductive flexible condenser plates fixed to the other side of said web and extending along the web in mutually transversely spaced relationship, said web and said condenser plates being folded along plural transverse lines so that one portion of the web and the plates overlap with another adjacent portion thereof to form a connector tab extending in upstanding relationship with respect to a remaining portion of the web which is secured to the container; and

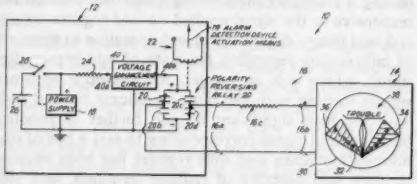
a cooperative connector and circuit means including a housing for containing said capacitive bridge circuit, the housing supporting multiple electrical contacts disposed in mutually transversely spaced relationship and operative to mate with and grip said tab and secure the housing thereon, and each contact being located respectively to align with and connect to one of said condenser plates, the contacts being coupled within the housing to the bridge circuit which is located in close proximity to the contacts, and the contacts providing low mutual capacity coupling between the plates and the bridge circuit.

4,083,039

VOLTAGE ENHANCEMENT CIRCUIT FOR CENTRAL STATION MONITORED ALARM SYSTEMS

Theodore Simon, 9 Maplewood Dr., Plainview, N.Y., assignor to Theodore Simon and Barry Schweiger, both of Garden City, N.Y. 11803

Filed Oct. 23, 1975, Ser. No. 625,084
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—248 R **10 Claims**



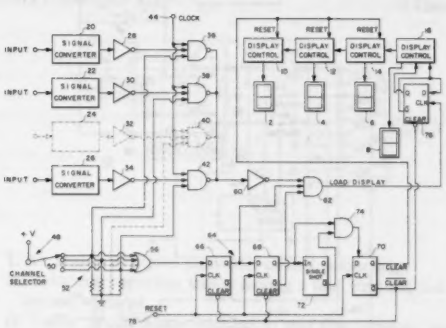
1. In combination with a centrally monitored alarm system of the type having at least one alarm detection device at a first location, an alarm monitoring panel at a second location, and electrically conductive lines interconnecting said device and said panel, the lines having an input terminal at said first location and an output terminal at said second location, the lines having an internal resistance between said terminals which is a function of the distance between said locations and therefore a function of the length of the lines, the detection device having a source of voltage of substantially fixed or constant magnitude or level which is applied to the input terminals of the lines in one condition of the alarm detection device, a portion of the voltage applied to said input terminals being dropped across said internal resistance and an output portion of the voltage applied to said input terminals appearing at said output terminals, and the monitoring panel including indicator means for providing an indication of said one condition of the alarm detection device when said output voltage portion at said output terminal has a magnitude above a minimum detectable level; and voltage enhancement means interposed between said source of voltage and said line input terminal for increasing the magnitude or level of said voltage source at said input terminal to at least partially compensate for said voltage portion dropped across said line internal resistance, whereby the voltage at said output terminal may be increased to at least said minimum detectable level irrespective of the length of the interconnecting lines.

4,083,040

TRACE LOCATOR FOR A MULTI-TRACE RECORDER

Paul A. Diddens, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Mich.

Filed Apr. 30, 1976, Ser. No. 682,021
Int. Cl.[2] G08B *5/36;* **G01D** *7/00;* **G06M** *3/06*
U.S. Cl. 340—248 A **7 Claims**



1. A trace locator circuit for identifying a record trace location on a recording medium in a recorder having a multi-element layered recording head comprising

input signal converter means for converting an input signal to be recorded to a corresponding recording head energizing signal, said converter means concurrently developing an output signal defining a time period representative of the amplitude of said energizing signal,

display means arranged to display a representation of a sum of a succession of input signals applied to said display means,

signal gate means connected between said converter means and said display means and being responsive to said output signal and to a gating signal to pass gate input signals through said gate means as input signals to said display means,

clock signal terminal means arranged to be connected to a source of clock signals and being connected to said gate means to apply the clock signals to said gate means as said gate input signals and

display enabling means connected to said gate means and to said display means to periodically apply said gating signal in combination with said output signal to said gating means to enable said gating means to pass said gate input signals and to clear said display means between said periodic applications of said gating signals to said gating means.

4,083,041

GROUND CIRCUIT MONITOR

Richard L. Bennice, Danielson, Conn., assignor to InterRoyal Corporation, New York, N.Y.

Continuation of Ser. No. 533,100, Dec. 16, 1974, abandoned. This application May 13, 1976, Ser. No. 685,956
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—255 **12 Claims**

1. A hospital bed system comprising:

an electrically conducting hospital bed frame,

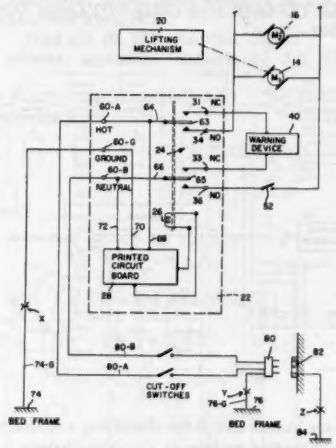
an electrical device associated with the frame in spatially adjacent disposition thereto and normally maintained out of electrical contact therewith,

disconnectable coupling means for electrically connecting the electrical device to a power supply source connecting line means having a power line, a neutral line and a ground line,

means for connecting the frame to the ground in series

through the ground line of the power supply source connecting line means, and

monitor means electrically connected between the power supply source connecting line means and the frame and



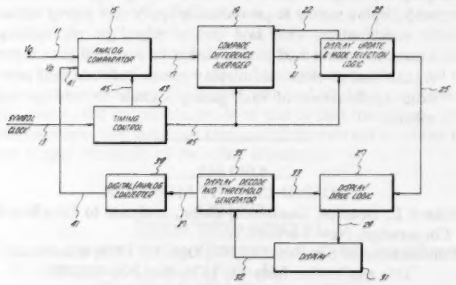
normally continuously energized by the power supply source for controlling the coupling means to disconnect the electrical device from both the power line and neutral line of the power supply source connecting line means upon interruption of the grounding of the frame.

4,083,042

CONTINUOUS QUANTITATIVE SIGNAL-DISPLAY SYSTEM USING LIGHT-EMITTING ELEMENTS

George Raymond Kushin, Plantation, and Ming-Luh Kao, Miami, both of Fla., assignors to Milgo Electronic Corporation, Miami, Fla.

Filed Jun. 23, 1975, Ser. No. 589,467
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 M **26 Claims**



1. A continuous, quantitative analog-signal-display system, using a serial string of light-emitting elements, said system comprising:

means for generating an analog signal representative of the illuminated elements;

means for continuously comparing the analog signal from said generating means with the analog signal to be displayed; and

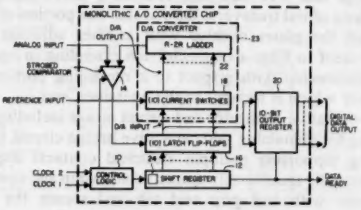
means for changing the illumination of said light-emitting elements in response to the output from said comparing means.

4,083,043

HIGH SPEED MONOLITHIC A/D CONVERTER UTILIZING STROBE COMPARATOR

David R. Breuer, Malibu, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Feb. 18, 1976, Ser. No. 658,974
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD **2 Claims**



1. An analog-to-digital converter of the type using a successive approximation algorithm to quantize an analog input signal comprising:

clock means providing a first clock signal characterized by a first frequency and a second clock signal characterized by a second frequency that is greater than said first frequency;

shift register means having a plurality of register terminals and being responsive to said first clock signal and operative to sequentially shift a portion of said first clock signal through said register such that said portion of said first clock signal is sequentially applied to said register terminals at said second frequency;

latch means comprised of current-mode differential logic that is required to be driven by a binary digital signal having a relatively high voltage, said latch means being responsive to the signal applied on said register terminals and said binary digital signal and operative to store *n* bits of information regarding the state of said binary digital signal, where *n* is an integer, to develop *n* sequencing signals starting with the most significant bit and ending with the least significant bit and further to produce a binary output signal corresponding to said *n* bits of stored information when said shift register has been sequenced through said plurality of register terminals, said binary output signal being representative of the magnitude of the analog input signal;

digital-to-analog converter means responsive to said sequencing signals and operative to sequentially and cyclically provide *n* reference signals, each being representative of a predetermined voltage in accordance with the binary weighted value of the sequencing signals; and

comparator means including a first input terminal for receiving the analog input signal, a second input terminal for sequentially receiving each said reference signal, a control terminal for receiving said second clock signal and an output terminal and being switchable between a first and a second electrical configuration in response to said second clock signal, said first configuration having a relatively low amplification factor and serving to develop an intermediate signal when the magnitude of said reference signal exceeds that of said analog input signal, said second configuration having a relatively large amplification factor and including positive feedback, said second configuration being responsive to said intermediate signal and operative to amplify said intermediate signal so as to provide said binary digital signal on said output terminal, said positive feedback serving to latch said binary digital signal independent of the signals applied to said first and second input terminals, thereby rendering said second configuration insensitive to said analog input signal and said reference signal, said binary digital signal serving to drive said latch means, said latch means serving to store said infor-

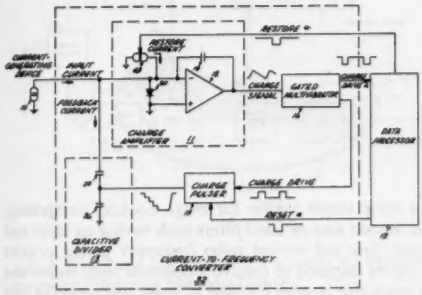
mation regarding the state of said binary digital signal and to produce said binary output signal representative of the magnitude of said analog input voltage.

4,083,044

UNIPOLAR WIDE-RANGE CURRENT-TO-FREQUENCY CONVERTER

J. Howard Marshall, III, Pasadena, and Timothy M. Harrington, Sierra Madre, both of Calif., assignors to MDH Industries Inc., Monrovia, Calif.

Filed Mar. 10, 1976, Ser. No. 665,385
Int. Cl.² H03K *13/20*
U.S. Cl. 340—347 AD **8 Claims**



1. For use in combination in a circuit for digitizing unipolar signal currents, an improved current-to-frequency converter comprising:

(a) amplifier means, adapted to receive an input current having a signal current, a restoration current and repetitive discrete feedback charge pulses, for providing a comparison between the charge arising from the signal plus restoration currents and the total discrete feedback charge, and for producing an output voltage proportional to the difference between the total feedback charge and the total charge produced by the signal and restoration currents;

(b) charge-generating means, connected to the output of the amplifier means, for producing known amounts of charge at a charge output whenever the amplifier means indicates that the feedback charge has a smaller absolute magnitude than the signal plus restoration charges, and for producing at those times output pulses whose repetition rate becomes an output frequency signal;

(c) capacitive-divider means, connected between the charge output of the charge-generating means and the input to the amplifier means, for attenuating the charge generated by the charge-generating means, to produce said repetitive discrete feedback charge pulses;

(d) pulse-generating means connected to the charge-generating means, said pulse-generating means producing pulses which cause the capacitive-divider means to be discharged in such a fashion that the current-to-frequency converter establishes its own zero level; and

(e) restoration-current means; connected to the input of the amplifier means, said restoration-current means generating on command a current flowing in the same direction as the signal current;

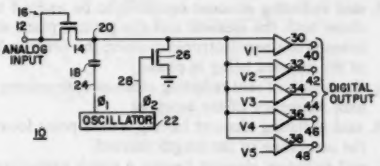
whereby, analog-to-digital conversion is accomplished by producing a train of pulses at the frequency output with a repetition frequency related in a known way to the total current applied to the input of the current-to-frequency converter.

4,083,045

MOS ANALOG TO DIGITAL CONVERTER

William Walter Lattin, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 3, 1975, Ser. No. 593,074
Int. Cl.² H03K *13/00*
U.S. Cl. 340—347 AD **6 Claims**



1. An analog to digital converter circuit comprising:

(a) enhanced capacitor means having a first terminal and a second terminal;

(b) buffer circuit means coupled to said first terminal, said buffer circuit means responsive to an analog input signal;

(c) digital comparator means having a first input terminal coupled to said first terminal and having a second input terminal coupled to a reference voltage, said digital comparator means producing a first logical state when said first input terminal is at a greater potential than said second input terminal and said digital comparator means producing a second logical output state when said first input terminal is at a lesser potential than said second input terminal;

(d) circuit means coupled to said second capacitor terminal for producing a voltage pulse at said second capacitor terminal, thereby inducing a derived voltage pulse at said first capacitance terminal said derived voltage pulse establishing input conditions at said first input terminal to produce a digital output signal proportional to said analog input signal, and

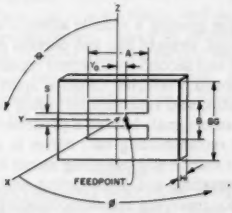
(e) MOSFET switching means coupled to said first capacitor terminal and coupled to said circuit means, said MOSFET switching means responsive to said circuit means for establishing initial voltage conditions at said first capacitor terminal.

4,083,046

ELECTRIC MONOMICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,694
Int. Cl.² H01Q *1/38*
U.S. Cl. 343—700 MS **60 Claims**



1. A notched fed electric monomicrostrip dipole antenna structure comprising:

a. a dielectric substrate;

b. a thin rectangular radiating element disposed on one side of said dielectric substrate;

c. a thin non-radiating ground plane conductor disposed on

the other side of said dielectric substrate directly opposite to said radiating element;

d. said ground plane being identical in length to the length of said radiating element; said ground plane and said radiating element being aligned lengthwise;

e. said ground plane extending in width on each side beyond the width of said radiating element to cause a mismatch such that the ground plane will not be excited;

f. said radiating element operable to be excited to radiate about both the element and the ground plane side of the antenna in a near isotropic manner; the fields on both sides of the antenna being in phase;

g. the length of said radiating element determining the resonant frequency of the antenna;

h. said radiating element having a feed point located along the centerline of the length thereof;

i. said radiating element having a notch extending into the element along the centerline of the length from one end thereof to said feed point;

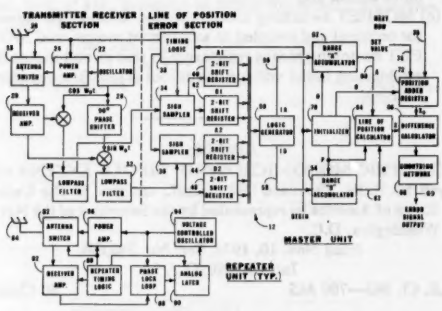
j. the antenna input impedance being variable to match most practical impedances as said feed point is moved along the element centerline without affecting the radiation pattern;

k. the antenna bandwidth being variable with the width of said radiating element and the spacing between the radiating element and said ground plane, the width of said notch being a factor as to the effective width of said radiating element, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the width of said radiating element.

4,083,047
VEHICLE GUIDANCE SYSTEM

Rudolph D. Schalow, Fort Wayne, Ind., assignor to Energystics, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 494,564, Aug. 5, 1974, abandoned. This application Dec. 16, 1975, Ser. No. 641,163
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—7 VM **20 Claims**

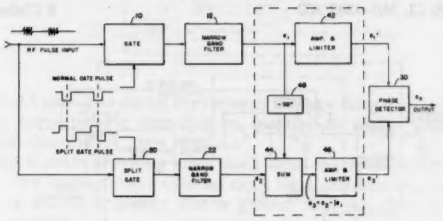


1. A system for guiding a vehicle along a selected one of a plurality of spaced, straight line and parallel paths, the system comprising first and second radio signal repeaters, said repeaters being positioned a selected distance apart on a line transverse to said paths, said repeaters including means for receiving a burst of radio signals having a predetermined frequency and alternately retransmitting said bursts in a predetermined time sequence, a mobile unit including means for cyclically and repetitively generating and transmitting said bursts of radio signals, means for receiving and demodulating said retransmitted bursts from said repeaters in sequence, and incremental range signal generating means connected to said receiving and demodulating means for generating first and second incremental range signals proportional to the incremental movement of said mobile unit with respect to said first and second repeaters, respectively, computing circuit means connected to receive said incremental range signals for arithmetically combining same to generate an incremental error signal when said movement deviates from a said selected path and error indicating means connected to receive said incremental error signal for continuously generating an indication of the magnitude of said incremental error signal.

4,083,048
TIME ALIGNMENT ERROR SENSOR SYSTEM FOR RANGE TRACKING

Robert J. DeRosa, Sudbury, and Robert T. Campbell, Acton, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1976, Ser. No. 752,505
Int. Cl.[2] G01S 9/14
U.S. Cl. 343—7.3 **2 Claims**

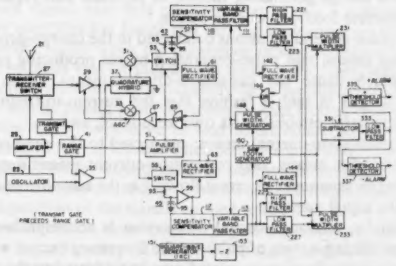


1. An error sensor system for range tracking comprising: first and second narrow band filters each having an input and an output; first and second radio frequency gating circuits having inputs disposed to receive a common input signal and having respective outputs coupled to respective inputs of said filters; phase detection means having first and second inputs and an output; first and second amplifier-limiter circuits having respective inputs coupled to receive respective outputs of said first and second filters, and having respective outputs coupled to said first and second inputs of said phase detector means, said phase detector means output being disposed for providing an output voltage signal; a summing circuit having first and second inputs and an output, said first input being coupled to the output of said second filter, the output being coupled to the input of said second limiter-amplifier circuit; and a phase shifter coupled between the output of said first filter and the second input of said summing circuit for providing a phase-shifted signal input thereto.

4,083,049
MOVING TARGET RADAR

John Mattern, Baltimore, and Earnest R. Harrison, Glen Burnie, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1971, Ser. No. 166,919
Int. Cl.[2] G01S 9/42
U.S. Cl. 343—7.7 **12 Claims**



1. The method of suppressing clutter in the operation of a moving-target radar, said clutter being produced by an object

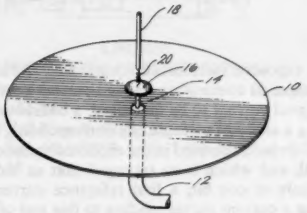
which moves backward and forward about a fixed position, the received signal of said radar being converted into quadrature signals, herein called an I signal and a Q signal, the said method comprising, converting the I signal into quadrature signals, herein called I3 and I4 signals, I3 lagging I4 by 90°, converting the Q signal into quadrature signals, herein called Q3 and Q4, Q3 lagging Q4 by 90°, deriving at least one of the products I3Q4 or I4Q3 and producing responsive to said product an indication of the target and the direction of movement of the target while suppressing the clutter.

4,083,050

DUAL BAND MONOPOLE OMNI ANTENNA

Roger D. Hall, Encino, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Sep. 1, 1976, Ser. No. 719,488
Int. Cl.² H01Q 9/38
U.S. Cl. 343—729 **6 Claims**



1. A wide-band high-frequency antenna for reception over separated frequency bands including

mounting and support means,

a coaxial connector fastened to said mounting and support means,

an upstanding member of dielectric material carried on said mounting and support means and a conductor track on the surface of said member constituting the radiating element of said antenna electrically connected to the center conductor of said coaxial connector including, connected in series, a highfrequency stub element, a capacitive loading member for said stub element at the higher of said frequency bands, an inductive member having very high impedance at the higher of said frequency bands and low impedance at the lower of said frequency bands, and a monopole element aligned with said stub, said capacitive element and said inductive element, the combined length of said elements being such as to provide a one-quarter wave length monopole antenna at the lower of said frequency bands.

4,083,051

CIRCULARLY-POLARIZED ANTENNA SYSTEM USING TILTED DIPOLES

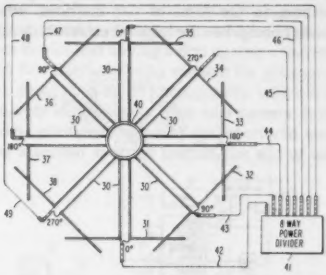
Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 2, 1976, Ser. No. 702,341
Int. Cl.² H01Q 21/26, 21/00
U.S. Cl. 343—797 **5 Claims**

1. An omnidirectional circular polarization antenna system comprising:

a plurality of dipoles equally spaced from one another about a conductive support mast with the dipoles equally spaced from the mast with their centers lying on a circle in a plane orthogonal to said mast, each of said dipoles having dipole halves with the one dipole half extending above and the other dipole half extending below said plane and the dipole halves being tilted at the same acute angle with respect to said plane,

means for exciting said dipoles in rotating phase where the mode number equal to the number of 360° phase changes about the ring of said dipoles is an integer other than zero, said tilt angle being determined to radiate from said antenna system circularly polarized waves omnidirectionally broadside said mast.

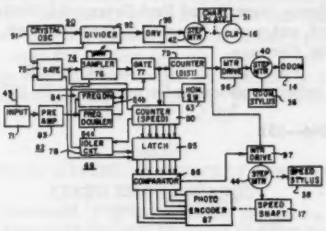


4,083,052

ELECTRONIC TACHOGRAPH

Wilbur F. Metcalf, Springfield, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

Filed Jun. 16, 1976, Ser. No. 696,814
Int. Cl.² G01D 9/30, 5/244; G01P 1/08
U.S. Cl. 346—18 **30 Claims**



1. In an electronic tachograph including recording means for recording at least indications of the distance travelled by a vehicle and the speed of the vehicle, the combination comprising input means for providing distance pulses indicative of the distance travelled by a vehicle, timing means operable to provide timing pulse, first means for deriving from said timing pulses a first output indicative of time, adjustable means responsive to said timing pulses for periodically sampling said distance pulses during sampling periods of a preselected duration to provide a predetermined number of distance pulses at an output thereof during a given sampling period for a predetermined distance of travel by said vehicle, second means responsive to said predetermined pulses for deriving a second output indicative of the speed of said vehicle, and third means responsive to said predetermined pulses to provide a third output indicative of the distance travelled by said vehicle, said recording means being responsive to said first, second and third outputs for recording said indications of distance and speed for said vehicle in relation to time.

4,083,053

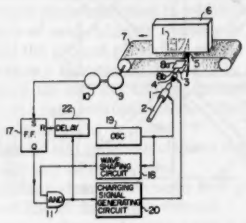
INK JET RECORDING METHOD AND APPARATUS

Yoshio Ouchi, Mito, and Takatoshi Ikeda, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 17, 1976, Ser. No. 667,468
Claims priority, application Japan, Mar. 19, 1975, 50-32354
Int. Cl.² G01D 15/18
U.S. Cl. 346—75 **3 Claims**

2. An ink jet recording method including the steps of gener-

ating ink droplets continuously at constant intervals, deflecting said ink droplets in a direction, moving a record medium in a right angle to said direction thereby forming a picture on the record medium in the form of dot matrices, wherein said method further comprises the steps of: establishing ink droplets



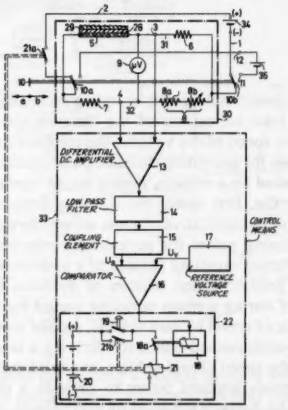
which do not correspond to picture elements, between an ink droplet corresponding to a last picture element on a scanning line and an ink droplet corresponding to a first picture element on a following scanning line; and changing the number of said ink droplets which do not correspond to the picture elements depending on the moving velocity of said record medium.

4,083,054

RECORDING OR ERASURE OF IMAGES ON THERMOPLASTIC MATERIAL

Roland Moraw, Naurod, and Kurt Dryczynski, Wallau, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 21, 1975, Ser. No. 634,057
Claims priority, application Germany, Nov. 25, 1974, 2455742
Int. Cl.² G01D *15/10*
U.S. Cl. 346—151 **19 Claims**



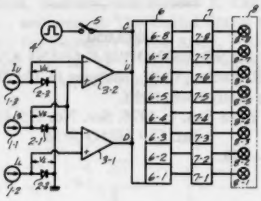
1. A method of recording or erasing an image on thermoplastic recording material comprising the steps of supplying an adjustable quantity of heat for reaching a required temperature for thermal development or erasure, said adjustable quantity of heat supplied in accordance with the temperature of the recording material at the time of supplying the heat, and resupplying said adjustable quantity of heat for a subsequent recording process during the cooling of the recording material when said recording material has reached that temperature which is just below the deformation temperature necessary for thermal development wherein the quantity of heat required for a new recording process is supplied at a temperature which is 7° to 15° C lower than the deformation temperature.

4,083,055

EXPOSURE INFORMATION QUANTIZING CIRCUIT UTILIZING SHIFT REGISTER

Yukiyasu Nishikawa, Kawagoe, and Takuo Itagaki, Wako, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1976, Ser. No. 667,533
Claims priority, application Japan, Mar. 20, 1975, 50-33862
Int. Cl.² G03B *7/08*
U.S. Cl. 354—23 D **9 Claims**



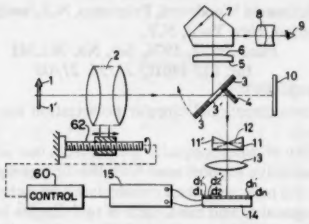
1. An exposure information quantizing circuit for photographic cameras comprising a signal current source for generating a signal current to be quantized; a bidirection shift register having a series of multiple bits corresponding in turn to the ranges of division required in the expected variation in range of the signal, and which is so arranged that an index is always present only at one bit; a first reference current source for producing a current corresponding to one end of the range of the bit having the index; a second reference current source for producing a current corresponding to the other end of said range; logarithmic compression elements connected respectively to the signal current source, the first reference current source and the second reference current source to respectively obtain a signal voltage, a first reference voltage and a second reference voltage, which are respectively proportional to the logarithm of the corresponding current values; a voltage comparator for forming a shift control signal for said bidirection shift register in accordance with comparison thereby of the magnitude of the signal voltage with that of the first reference voltage or the second reference voltage; and a pulse generator for providing clock pulses for said bidirection shift register.

4,083,056

FOCUS DETECTING DEVICE FOR SINGLE-LENS REFLEX CAMERAS

Kazuo Nakamura, Asaka; Katsuhiko Miyata, Tsurugashima, and Seijiro Tokutomi, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1976, Ser. No. 717,821
Claims priority, application Japan, Sep. 9, 1975, 50-109114; Sep. 26, 1975, 50-116786; Sep. 27, 1975, 50-132258
Int. Cl.² G03B *7/08*
U.S. Cl. 354—25 **11 Claims**



1. In a single lens reflex camera of the type having a reflecting mirror for directing light towards a finder optical system during pre-photography operation, a focusing plate positioned to re-

ceive light passing through said focusing plate, and a finder optical system positioned to receive light reflected from the surfaces of said pentaprism, whereby said camera can be focused by a photographer adjusting a lens system and observing an object's image through the finder optical system, the improvement characterized by,

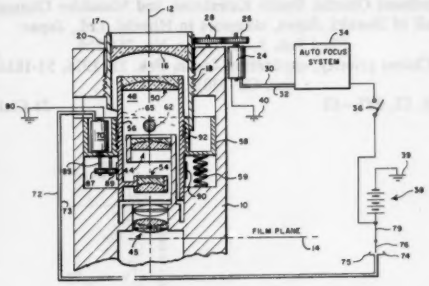
a group of light detecting elements positioned in said camera to receive said object's image, said group of light detecting elements comprising a plurality of photodiodes interconnected to have the photo currents from adjacent ones combined subtractively providing a plurality of discrete contrast indicating difference currents, whereby a maximum of the sum of the absolute values of said contrast currents occurs when an in-focus condition is reached, processing means connected to said group of light detecting elements for detecting a sum of the absolute values, raised to a preselected power, of said difference currents and for providing an indication for a photographer when said sum is above a predetermined level.

4,083,057

FOCUS SIZE COMPENSATION

Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 8, 1976, Ser. No. 739,664
Int. Cl.² G03B *3/00, 7/08, 13/02*
U.S. Cl. 354—25 **15 Claims**



1. Apparatus for use in an optical system having an image plane and lens means movable along an axis to provide a focused image of an object at the image plane, and wherein movement of said lens means may produce a change of magnification of the image at the image plane, the improvement comprising:

zoom means movable along the axis to provide changes in magnification of the image of the object; and

characterized means connected to said lens means and to said zoom means so that movement of said lens means along said axis is accompanied by movement of said zoom means along said axis, the characterization of said characterized means being so chosen that the amount of movement of said zoom means accompanying a given amount of movement of said lens means is such as to substantially off-set the change of magnification produced by the movement of said lens means.

4,083,058

FLASH AND CAMERA APPARATUS HAVING A PLURALITY OF FLASH AND DAYLIGHT OPERATION MODES

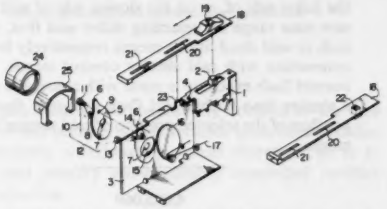
Hiroshi Iwata, Osaka, and Yu Tsuzuki, Hirakata, both of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Apr. 12, 1976, Ser. No. 675,756
Claims priority, application Japan, Apr. 17, 1975, 50-47129
Int. Cl.² G03B *15/05*
U.S. Cl. 354—128 **5 Claims**

1. In a flash and camera apparatus integrally incorporating a photographic camera device with a fixed focus lens system and an electronic flash device having a flash discharge tube which emits flash light by discharging energy stored in a main discharge capacitor, the improvement comprising

an aperture member comprising part of said photographic camera device and having a first aperture therein, the size of said first aperture being suitable for photographing an object, using flash-mode photography, which is located at a relatively long distance from said camera device,

an iris vane positioned adjacent said apertured member and having a second aperture therein, the size of said second



aperture being less than that of said first aperture and suitable for photographing an object, using flash-mode photography, which is located at a relatively short distance from said camera device, said second aperture also being suitable for daylight mode photography;

mode switching means for coupling a power switch for said electronic flash device to said iris vane so that operation of said power switch causes movement of said iris vane; and

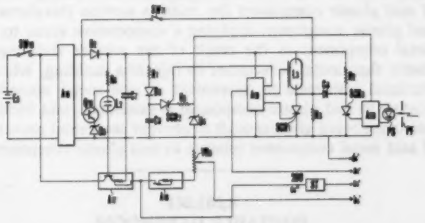
holding means for holding said iris vane in a first position wherein said vane blocks said first aperture so that light entering said camera passes through said second aperture.

4,083,059

AUTOMATIC EXPOSURE CONTROL SYSTEM FOR FLASH PHOTOGRAPHY

Tokuichi Tsunekawa, Yokohama; Zenso Nakamura, Urawa; Tetsuya Taguchi, Kawasaki; Masanori Uchidoi, Yokohama; Hiroshi Aizawa, Machida, and Takashi Uchiyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 615,365, Sep. 22, 1975, abandoned. This application Aug. 26, 1976, Ser. No. 717,950
Claims priority, application Japan, Sep. 26, 1974, 49-111302
Int. Cl.² G03B *15/03*
U.S. Cl. 354—149 **28 Claims**



1. In an automatic exposure control apparatus for a camera of the type provided with a day-light exposure range and with a flash exposure range;

a. shutter time setting means arranged to provide a range of shutter times wider than a possible flash exposure time range,

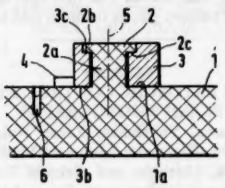
b. first timing means cooperative with said shutter time setting means for generating voltage capable of attaining a critical level in a time interval equal to the shutter time preselected on said shutter time setting means,

c. second timing means for generating voltage capable of attaining said critical level in a time interval equal to the faster limit of said flash exposure time range,
d. third timing means for generating voltage capable of attaining said critical level in a time interval equal to the slower limit of said flash exposure time range,
e. shutter control means selectively responsive to the outputs of said first, said second and said third timing means for controlling the period of actuation of the shutter of said camera,
f. selecting means responsive to the setting of said shutter time setting means to a shutter time either within, or on the faster side of, or on the slower side of said flash exposure time range for selecting either said first, or said second, or said third timing means respectively for operative connection with said shutter control means, whereby a correct flash exposure is made with automatic selection of a shutter time within said flash exposure time range regardless of the selected position of said shutter time setting means.

4,083,060
CAMERA MECHANISM PROVIDING FOR RELATIVE MOVEMENT OF COMPONENTS AGAINST FRICTIONAL RESISTANCE

Karl Heinz Lange, Bunde, Germany, assignor to Balda-Werke Photographische Gerate & Kunststoff GmbH. & Co. KG, Bunde, Germany

Filed Aug. 28, 1975, Ser. No. 608,793
Claims priority, application Germany, Sep. 26, 1974, 2445990
Int. Cl.[2] G03B *17/12*
U.S. Cl. 354—286 9 Claims



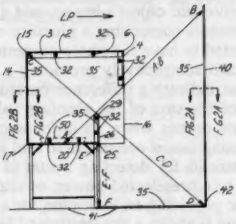
1. Camera mechanism comprising a camera body, a metal component associated with said camera body, a plastic component injection-molded about said metal component, said metal component being movably held in said plastic component, said plastic component having opposing surfaces and said metal component having a surface engaging said opposing surfaces of said plastic component for relative motion therebetween, said plastic component applying a compressive force to said metal component as the result of the greater shrinkage of plastic than metal subsequent to injection molding, whereby frictional resistance to movement of said metal component relative to said plastic component is generated, said frictional resistance being great enough to prevent accidental movement of said metal component relative to said plastic component.

4,083,061
PORTABLE DARKROOM

George H. Barrows, 1279 Bassett, Louisville, Ky. 40204

Filed Apr. 26, 1976, Ser. No. 680,147
Int. Cl.[2] G03D *17/00*
U.S. Cl. 354—307 6 Claims

1. A portable darkroom, the combination of a box having a closed top, bottom, back, sides and a partially open front, the improvement of a light trap in the front which comprises:
A. an accessible opening in the front of said box defined by,
1. a bottom baffle extending upwardly from the bottom of said box,
2. a top baffle extending downwardly from the front edge of the top of said box in spaced apart and parallel relation to said bottom baffle and forward thereof, said top of said box extending forward of the bottom baffle and,
3. a non-reflective surface on the inside surface of said box to exclude reflections of light within said box, and,

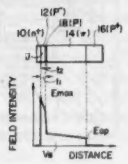


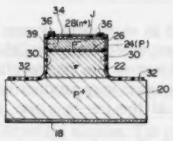
B. a non-reflective surface removably attached to the floor and wall portions adjacent to said opening to eliminate reflective light from entering said opening.

4,083,062
AVALANCHE PHOTODIODE WITH REDUCED AVALANCHE BREAKDOWN VOLTAGE

Hirobumi Ohuchi; Sumio Kawakami, and Masahiro Okamura, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 8, 1977, Ser. No. 766,724
Claims priority, application Japan, Feb. 21, 1976, 51-18310
Int. Cl.[2] H01L *29/90*
U.S. Cl. 357—13 21 Claims





1. An avalanche photodiode with a reduced avalanche breakdown voltage comprising:
(a) a semiconductor body comprising
a first semiconductor layer of one conductivity type,
a second semiconductor layer of the opposite conductivity type, adjoining the first layer, forming a rectification barrier with said first layer, said barrier being biased in the reverse direction when a predetermined voltage is applied thereto,
a third semiconductor layer of the opposite conductivity type, adjoining said second layer, having a higher doping concentration than said second layer,
a fourth semiconductor layer of the opposite conductivity type, adjoining said third layer, having a lower doping concentration than said second layer, and
a fifth semiconductor layer of the opposite conductivity type, adjoining said fourth layer, and having a higher doping concentration than said third layer;
(b) a first electrode in ohmic contact with said first layer;
(c) a second electrode in ohmic contact with said fifth layer;
(d) a film, which covers a light-receiving surface defined in the surface of one of said first and fifth layers, for prevent-

ing reflection of a light signal applied to said light-receiving surface; and

(e) a protecting film which covers the end face of said barrier extended to the surface of said semiconductor body for protecting said barrier from ambient influences.

4,083,063

GATE TURNOFF THYRISTOR WITH A PILOT SCR

Rosendo U. Yu, Auburn, N.Y., assignor to General Electric Company, Auburn, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,494

Int. Cl.[2] H01L *29/74*

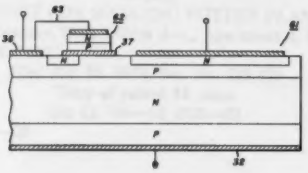
U.S. Cl. 357—38 **14 Claims**

1. A thyristor comprising:

gate terminal means for receiving triggering signals;

a pilot semiconductor controlled rectifier comprising pilot contact means, said pilot semiconductor controlled rectifier being for selectively controlling current flow through said pilot contact means in response to triggering signals received by said gate terminal means;

a primary semiconductor controlled rectifier formed in the same body of semiconductor material as said pilot semiconductor controlled rectifier and comprising primary contact means, said primary semiconductor controlled rectifier being for selectively controlling current flow through said primary contact means in response to current flow through said pilot contact means; and



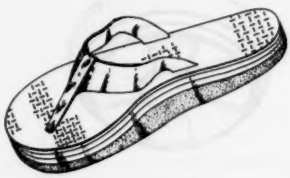
auxiliary gate terminal means directly coupled to the gate region of said primary semiconductor controlled rectifier for selectively withdrawing current therefrom so as to render said primary semiconductor controlled rectifier non-conductive.

DESIGNS

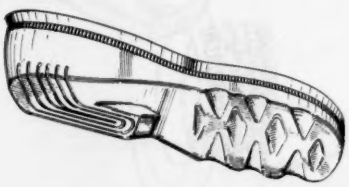
APRIL 4, 1978

247,656
CONFECTIONERY FOOD PRODUCT
Kathleen Dillon, Houston, Tex., assignor to Jack E. Dillon, a part interest
Filed Apr. 7, 1976, Ser. No. 674,854
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—16

247,657
THONG SANDAL
Harold D. York, Jr., 3952 Bluff St., Torrance, Calif. 90505
Filed Feb. 20, 1976, Ser. No. 659,962
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

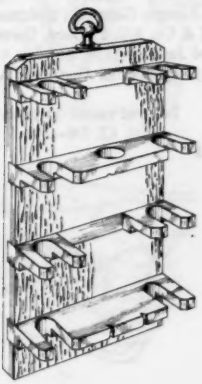


247,658
UNIT SOLE
Peter Charles Keen, Cincinnati, Ohio, assignor to United States Shoe Corporation, Cincinnati, Ohio
Filed Feb. 6, 1976, Ser. No. 655,699
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



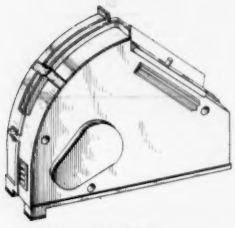
247,659
SUPPORT FOR HANGING POTTED PLANTS
Linden P. Kearney, 8801 Tobias Ave., Apartment 4, Panorama City, Calif. 91402
Filed Jul. 25, 1977, Ser. No. 818,470
Term of patent 14 years
Int. Cl. D6—*06*; D25—*01*
U.S. Cl. D6—28

247,660
WINE RACK
Michael A. Tortorici, 3190 Fletcher, Simi Valley, Calif. 93065
Filed May 3, 1976, Ser. No. 682,394
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—71

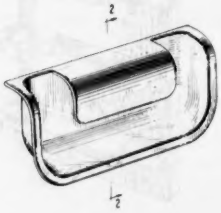


247,661
BARBECUE GRILL
Allen D. Willard, 16 Bellevue Rd., Wellesley Hills, Mass. 02181, and Mario A. Genovese, 10 Lincoln St., South Natick, Mass. 01760
Filed May 10, 1976, Ser. No. 684,785
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—107

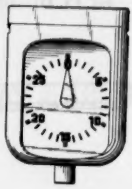
247,662
RECORD CLEANING DEVICE
John S. Doyel, 110 W. 20th St., New York, N.Y. 10011
Filed Sep. 23, 1976, Ser. No. 725,937
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—161



247,663
HANDLE FOR FURNITURE DOORS, DRAWERS OR THE LIKE
Roland Spellier, Lemgo, Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Herford, Germany
Filed Jan. 30, 1976, Ser. No. 653,852
Claims priority, application Germany, Aug. 1, 1975, 6 AR 138/75
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—313



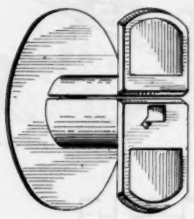
247,664
RAIN GAUGE
Carl Arne Breger, Torup, Sweden, assignor to AB Filip Linden, Varnamo, Sweden
Filed Apr. 21, 1976, Ser. No. 678,944
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—101



247,665
FIRE ALARM HOUSING
Larry D. Larsen, Palatine, Ill., assignor to Patent Development & Management Company, Elgin, Ill.
Filed Feb. 23, 1976, Ser. No. 660,254
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121

247,666
TIRE
Yvon Maurice Dartois, La Garenne Colombes, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes, France
Filed Sep. 22, 1976, Ser. No. 725,655
Claims priority, application France, Apr. 5, 1976, 39.092
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

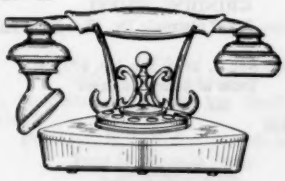
247,667
FILM REEL
James G. Balmer, Jr., Bloomfield Hills, Mich., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 28, 1975, Ser. No. 626,392
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—11

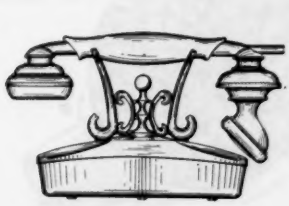


247,668
HOUSING FOR A MICROPHONE OR SIMILAR ARTICLE
Norman Roland Furst, Lombard, and Masaru Tokiyama, Bloomingdale, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 25, 1976, Ser. No. 670,506
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

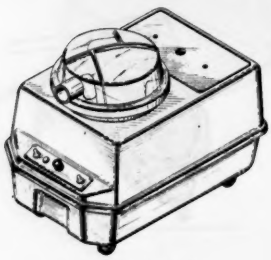
247,669
COMBINED TRANSCEIVER REMOTE-CONTROL MICROPHONE
Tsutomu Murakami, Neyagawa, and Benito Mishiro, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Mar. 22, 1977, Ser. No. 780,179
Claims priority, application Japan, Sep. 28, 1976, 38549/76
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

247,670
TELEPHONE OR SIMILAR ARTICLE
Paul R. Brown, New York, N.Y., assignor to United States Telephone Company, New York, N.Y.
Filed Apr. 30, 1976, Ser. No. 681,881
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

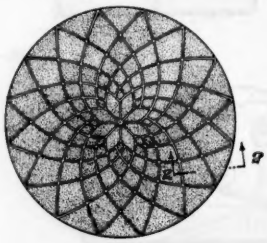




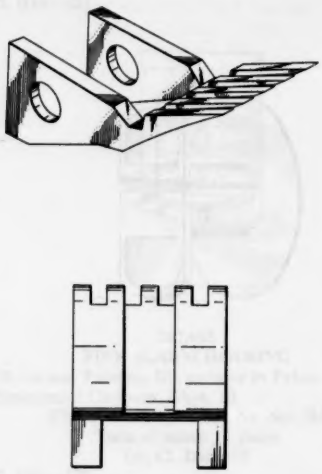
247,671
HOT-WATER EXTRACTION UNIT
Thomas M. Laule, Sparks; Carl Parise, Reno; James M. Wimsatt, Carson City, and R. Eugene Blackman, Reno, all of Nev., assignors to Parise & Sons, Inc., Reno, Nev.
Filed May 25, 1976, Ser. No. 689,871
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52



247,672
GRINDING WHEEL
James Allen Kruse, 22937 Ostronic Dr., Woodland Hills, Calif. 91364
Filed Apr. 1, 1976, Ser. No. 672,634
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126

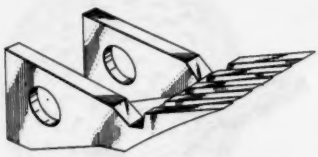


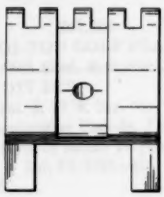
247,673
STRIPPER PAD
Eugene Behun, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 13, 1976, Ser. No. 750,096
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



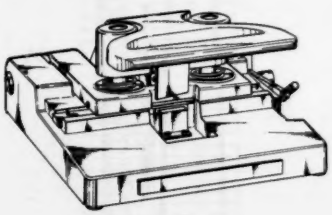
247,674
STRIPPER PAD
Eugene Behun, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 13, 1976, Ser. No. 750,098
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32

247,675
STRIPPER PAD
Eugene Behun, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 13, 1976, Ser. No. 750,099
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32

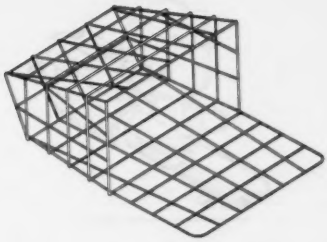




247,676
SPLICER
Kozo Nakahata, Tama, Japan, assignor to Marusho Industrial Co., Ltd., Tokyo, Japan
Filed Jun. 22, 1976, Ser. No. 698,635
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—41

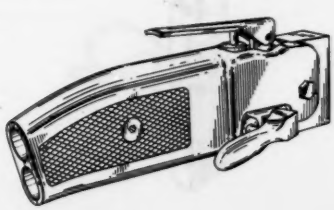


247,677
CRAB TRAP
Albert Bockhorn, 452 48th St., Pennsauken, N.J. 08110
Filed Jan. 3, 1977, Ser. No. 756,014
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18

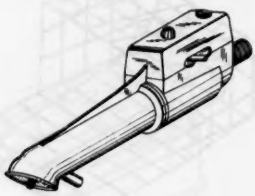


247,678
FISH LURE
Paul E. Brokaw, 292 Overlook Park Dr., Cleveland, Ohio 44110
Filed Aug. 16, 1976, Ser. No. 714,642
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

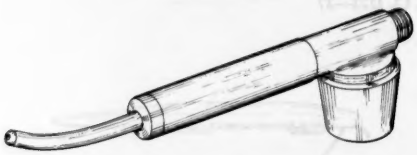
247,679
SPRAY GUN HANDLE
Thomas J. McMullen, 5529 Park Ave. South, Minneapolis, Minn. 55417
Filed Apr. 28, 1976, Ser. No. 681,187
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17



247,680
SHOWER HEAD
Alexandre José Antonio Lorenzetti, 1230 President Wilson Avenue, Sao Paulo, Brazil
Filed May 4, 1976, Ser. No. 683,024
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



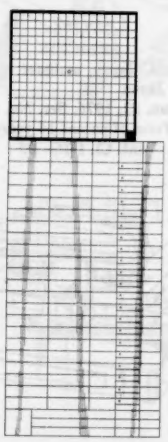
247,681
DOUCHE APPARATUS
William T. Hemphill, 2702 Craig St., Fort Myers, Fla. 33901
Filed Mar. 12, 1976, Ser. No. 666,253
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—61



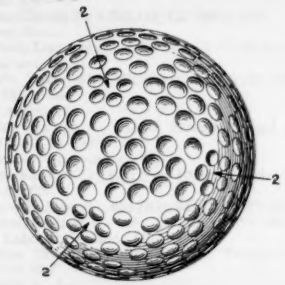
247,682
DISPOSABLE CIGARETTE GAS LIGHTER
Tomio Nitta, 2181-7, Enokiyato Kitahassaku-cho, Midori-ku, Yokohama-shi, Japan
Filed Aug. 31, 1976, Ser. No. 719,141
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

247,683
ELECTRIC HAIR DRYER
William J. Rakocy, Nutley, and Masao Tsuji, North Plainfield, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed Apr. 26, 1976, Ser. No. 680,109
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

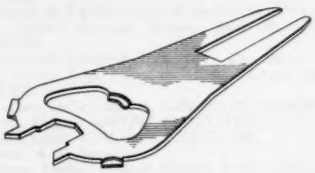
247,684
SCORE SHEET
Lee W. Tiffany, New York, N.Y., assignor to Selchow & Righter Company, Bay Shore, N.Y.
Filed Sep. 11, 1975, Ser. No. 612,323
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 MM



247,685
GOLF BALL
Robert Christopher Haines, Huddersfield, and Michael Shaw, Ryhill, near Wakefield, both of England, assignors to Dunlop Limited, England
Filed Feb. 19, 1976, Ser. No. 659,566
Claims priority, application United Kingdom, Sep. 6, 1975, 972471/75
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 QQ



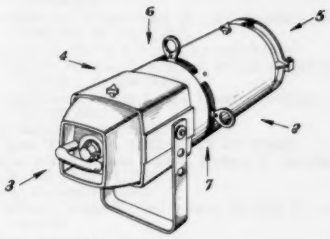
247,686
TOOL FOR GOLF PLAYER
Adrien Desjardins, 4545 Blvd. Rosemont, Appt. 18, Montreal, Quebec, Canada (H1T 2E2)
Filed Jul. 8, 1976, Ser. No. 703,645
Claims priority, application Canada, Jan. 20, 1976, 2001762
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



247,687
HEADGEAR TOY FOR HOOP WHIRLING OR THE LIKE
Bernadette C. Roland, 16856 Alisal Ct., San Lorenzo, Calif. 94580
Filed Jan. 10, 1977, Ser. No. 757,815
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 HP

247,688
TOY MUSIC BOX
Shinroku Nakao, Yokohama, and Yoshiyasu Ishii, Tokyo, both of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Dec. 9, 1976, Ser. No. 748,853
Claims priority, application Japan, Jul. 29, 1976, 51-29704
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C

247,689
LUMINAIRE
Craig LeVasseur, Calabasas, Calif., assignor to Berkey-Colortran, Inc, Burbank, Calif.
Filed Nov. 18, 1976, Ser. No. 742,894
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K



247,690
COMBINED PORTABLE FLUORESCENT LIGHT AND POWER PACK THEREFOR
Thomas Zelina, Erie, Pa., assignor to Lighting Systems, Inc., Erie, Pa.
Filed Mar. 22, 1976, Ser. No. 669,180
The portion of the term of this patent subsequent to Jul. 22, 1989, has been disclaimed.
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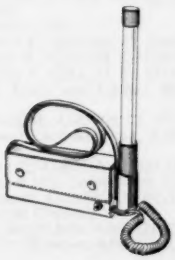

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TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF APRIL, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Gibson, David L.; Barrett, Lawrence J.; Moore, Patricia A.; and Butler, David R., 4,082,390, Cl. 312-284.000.

Barrette, Richard P., to Automated Molding Corporation. Matchbook covers. 4,082.182, Cl. 206-107.000.

Barrows, George H. Portable darkroom. 4,083,061, Cl. 354-307.000.

Barry, Leonard D. Overhead container transfer system. 4,082,042, Cl. 104-18.000.

Barton Hydraulic Engineering Company Limited: *See—*
Bainbridge, Cuthbert Angus, 4,082,669, Cl. 210-184.000.

Barton, Sterling C.; Carson, Chester C.; and Echeverria, Federico S., to General Electric Company. Generator monitoring apparatus. 4,082,948, Cl. 250-304.000.

BASF Aktiengesellschaft: *See—*
Buchan, William A.; and Rotter, Gerhard, 4,082,237, Cl. 242-192.000.
Buechner, Oskar; Schlichthaerle, Gottfried; and Urban, Friedrich, 4,082,910, Cl. 528-481.000.
Quadbeck-Seeger, Hans-Juergen; and Tonne, Peter, 4,082,749, Cl. 260-250.0BN.

Basic Vegetable Products, Inc.: *See—*
Cordes, Henry P., 4,082,189, Cl. 209-73.000.

Basiulis, Algerd: *See—*
Sun, Tsu-Hung; and Basiulis, Algerd, 4,082,109, Cl. 137-340.000.

Bassett, Robert James; Cordes, Walter John; and Fuchs, Julius Jakob, to Du Pont de Nemours, E. I., and Company. Methyl isocyanate process. 4,082,787, Cl. 260-453.00P.

Bastien, Roy C.: *See—*
Austin, Robert R.; and Bastien, Roy C., 4,082,413, Cl. 350-1.100.

Bathurst, David B. Electronic chess game. 4,082,285, Cl. 273-237.000.

Battaglia, Jean M.: *See—*
Chen, James Ling; and Battaglia, Jean M., 4,082,881, Cl. 424-241.000.

Baugh, Benton F., to Vetco, Inc. Gauge flange. 4,082,002, Cl. 73-756.000.

Baugh, Edward D., to General Motors Corporation. Mechanical engine governor with variable limiting speed setting. 4,082,074, Cl. 123-140.0FG.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Quaternary quinuclidinium carbamates and thiocarbamates. 4,082,756, Cl. 260-293.530.

Baumberger, John G.; Gazy, Michael A.; and Miller, William C., to International Business Machines Corporation. Document feeding apparatus. 4,082,263, Cl. 271-266.000.

Baxter, Ernest W. Rotary internal combustion engine. 4,082,065, Cl. 123-219.000.

Bayer Aktiengesellschaft: *See—*
Brinkschroder, Franz-Jurgen; Sandquist, Axel; and Johannaber, Friedrich, 4,082,488, Cl. 425-204.000.
Diehr, Hans-Joachim; and Arold, Hermann, 4,082,822, Cl. 260-972.000.
Nonn, Konrad; Wolf, Karlheinz; and Hornle, Reinold, 4,082,505, Cl. 8-85.00R.
Stephan, Bernd; Hund, Franz; and Holznagel, Wilhelm, 4,082,905, Cl. 428-538.000.
Zirngiebl, Eberhard, 4,082,631, Cl. 204-128.000.

BBC Aktiengesellschaft Brown, Boveri & Company, Ltd.: *See—*
Schulthess, Peter U.; and Wild, Peter J., 4,082,430, Cl. 350-333.000.

BBC Brown, Boveri & Company, Limited: *See—*
Menth, Anton; Perry, Anthony J.; and Spinner, Ulrich, 4,082,582, Cl. 148-102.000.

Beasley, Onan S., Jr. Drawer for knives and other utensils and tools. 4,082,386, Cl. 312-204.000.

Bebout, Robert W. Wood-turning process for making cylindroconical wood products. 4,082,126, Cl. 142-1.000.

Beck, Cyril G.: *See—*
Kleemann, Willi; and Beck, Cyril G., 4,082,548, Cl. 75-171.000.

Becker, Dale F., to Sangamo Weston, Inc. Rotating disc multielement polyphase meter. 4,083,000, Cl. 324-137.000.

Becker, Eugene. Photoprinting attachment system for enlargers. 4,082,452, Cl. 355-74.000.

Becker, Willi: *See—*
Wehde, Heinz; and Becker, Willi, 4,082,376, Cl. 308-10.000.

Beckwith, John R. Electrical magnetic switch adaptable for use in digital wristwatches. 4,082,927, Cl. 200-52.00R.

Bedford, John E., to Pricon, Inc. Method for protecting an internal combustion engine by determining the change point of the lubrication oil. 4,082,511, Cl. 23-230.0HC.

Beede, Charles H.; and Blumig, Theodore, to Johnson & Johnson. Pressure sensitive adhesive compositions. 4,082,705, Cl. 260-4.00R.

Beeferman, Dennis: *See—*
Esemplare, Pascal E.; and Beeferman, Dennis, 4,082,862, Cl. 427-133.000.

Beer, Wolfgang: *See—*
Rautenbach, Robert; Hoeck, Horst; and Beer, Wolfgang, 4,081,914, Cl. 34-92.000.

Beggs, Donald; and Kelley, Bruce G., to Midrex Corporation. Method for reducing particulate iron oxide to metallic iron with solid reductant. 4,082,543, Cl. 75-11.000.

Bell Telephone Laboratories, Incorporated: *See—*
Chang, Kuang-Chou; Heller, Adam; and Miller, Barry, 4,082,602, Cl. 156-627.000.
Heller, Adam; Miller, Barry; and Vadimsky, Richard George, 4,082,624, Cl. 204-47.000.
Skurkiss, Peter Kenny, 4,082,620, Cl. 204-15.000.

Bellina, Russell Frank; and Fost, Dennis Lynn, to Du Pont de Nemours, E. I., and Company. 2-Higher alkyl-3-hydroxy-1,4-naphthoquinone carboxylic acid esters. 4,082,848, Cl. 424-273.000.

Bendix Corporation, The: *See—*
Bourdon, Normand C.; Sanford, Richard; and Eifler, Raymond J., 4,082,398, Cl. 339-59.00M.
Hall, Roger D., 4,083,050, Cl. 343-729.000.
Ritsema, Irving R., 4,082,166, Cl. 188-73.600.

Bendler, Hellmut; and Bretfeld, Anton, to Dynamit Nobel Aktiengesell-

schaft. Apparatus for the thermal and electrical initiation of fire protection devices. 4,081,964, Cl. 60-636.000.

Benerito, Ruth R.: *See—*
Ward, Truman L.; and Benerito, Ruth R., 4,082,500, Cl. 8-120.000.

Benigni, Fulvio; and Trevisan, Lucio, to Italchemi S.p.A. Istituto Chimico Farmaceutico. Derivatives of 2H,3H-benzimidazo(1,2-b)oxazole. 4,082,760, Cl. 260-307.0FA.

Bennett, Frank P., to GAF Corporation. Compact microform reader. 4,082,440, Cl. 353-26.00R.

Bennice, Richard L., to InterRoyal Corporation. Ground circuit monitor. 4,083,041, Cl. 340-255.000.

Benson, Jerrel W. Cryosurgical system. 4,082,096, Cl. 128-303.100.

Bentivegna, Charles R., Jr.: *See—*
Schutt, Elmer F.; Thornton, Bryce G.; and Bentivegna, Charles R., Jr., 4,082,039, Cl. 101-450.000.

Berg, Charles A., to Pyreflex Corporation. Heat recuperation. 4,082,414, Cl. 350-1.700.

Bergee, Mark A.; and Gilchrist, William K. Protective helmet and ventilating system therefor. 4,081,865, Cl. 2-425.000.

Berger Industries, Inc.: *See—*
Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, 4,082,319, Cl. 285-27.000.

Berger, Paul Daniel, to Witco Chemical Corporation. Organo silicon/-silica defoamer compositions. 4,082,691, Cl. 252-358.000.

Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, to Berger Industries, Inc. Coupling sleeve. 4,082,319, Cl. 285-27.000.

Bergwerksverband GmbH: *See—*
Leonhardt, Joachim; and Klein, Hans-Dieter, 4,081,993, Cl. 73-88.00R.

Berkes, James R. Bicycle support system. 4,082,265, Cl. 272-73.000.

Berkey, George V., to Mr. Putt, Incorporated. Training apparatus for improving a golfer's putting technique. 4,082,287, Cl. 273-186.00C.

Berndt, Uwe; Erdmann, Bernhard; and Keller, Cornelius, to Gesellschaft fur Kernforschung m.b.H. Intermetallic compounds and metal purification. 4,082,547, Cl. 75-122.700.

Bernier, Richard: *See—*
Toepelt, Werner; and Bernier, Richard, 4,081,882, Cl. 24-205.00R.

Berrer, Dagmar: *See—*
Hoegerle, Karl; and Berrer, Dagmar, 4,082,535, Cl. 71-92.000.

Berry, Peter John: *See—*
Runciman, Herbert Morrison; and Berry, Peter John, 4,082,416, Cl. 350-6.800.
Runciman, Herbert Morrison; and Berry, Peter John, 4,082,417, Cl. 350-6.800.

Bertacchi, Ralph; and Gorell, Frederick R. Standoff insulated panel mounting. 4,081,938, Cl. 52-410.000.

Berthold, Heinz; and Gehring, Karl. Ship-loading installation. 4,082,181, Cl. 198-863.000.

Bevilacqua, Albert J.: *See—*
Page, Dennis M.; and Bevilacqua, Albert J., 4,082,086, Cl. 128-2.06E.

Beyer, Ralph E., to F. Jos. Lamb Company. Workpiece elevator. 4,082,179, Cl. 198-801.000.

Beyl, Jean Joseph Alfred. Safety ski binding. 4,082,313, Cl. 280-618.000.

BFG Baumgartner Freres SA: *See—*
Albrecht, Alfred, 4,082,302, Cl. 280-11.37H.

Bickford, William J.; Hatton, William L.; Pallemaerts, Colin J.; Tanzi, Paul J.; and Tsao, Carson K. H., to Raytheon Company. High reliability diversity communications system. 4,083,009, Cl. 325-304.000.

Bickl, Horst; Treiber, Helmut; Findeis, Gunter; Knor, Bernhard; Payrhammer, Bernd; and Fergg, Berthold, to AGFA-Gevaert, A.G. Determination of extreme density values of photographic originals. 4,082,465, Cl. 356-203.000.

Bierbach, Herbert: *See—*
Baron, Gerhard; Bierbach, Herbert; Hafke, Carl; and Pockrandt, Gunter, 4,082,520, Cl. 48-202.000.

Bigelow, John E., to General Electric Company. Variable intensity fluorescent display. 4,082,949, Cl. 250-329.000.

Bijok, Franciszek: *See—*
Szadkowska, Maria; Pisarek, Jerzy; Dzik, Boleslaw; Staniak, Elzbieta; Lipniewska, Danuta; and Bijok, Franciszek, 4,082,853, Cl. 426-36.000.

Binder, Herbert: *See—*
Keydell, Willi; and Binder, Herbert, 4,082,418, Cl. 350-10.000.

Bindicator Company: *See—*
Levine, Walter E., 4,081,889, Cl. 29-25.350.

Binks Manufacturing Company: *See—*
Krohn, Duane D.; and Culbertson, Samuel W., 4,081,904, Cl. 30-128.000.

Binney & Smith Inc.: *See—*
Clymer, Wilbur L.; and Klara, Charles J., 4,082,491, Cl. 425-440.000.

Bio-Life Company, Inc.: *See—*
McGrane, Merle V.; and McGrane, Earl F., 4,082,227, Cl. 239-675.000.

Bio-Syn, Inc.: *See—*
DeVaughn, Donald H., 4,082,614, Cl. 195-139.000.

Biotest-Serum-Institut GmbH: *See—*
Stephan, Wolfgang, 4,082,734, Cl. 260-112.00B.

Birman, Joseph L.; and Mayburg, Sumner, to GTE Laboratories Incorporated. Optical maser. 4,083,017, Cl. 331-94.50H.

Bittel, Patricia A., to Weatherchem Corporation. Two-piece end closure with assembly device. 4,082,201, Cl. 220-339.000.

Black, Richard D.; and Morgan, Thomas E., Jr. Anti-skid and pressure balanced hydraulic brake system. 4,082,369, Cl. 303-3.000.

Blackburn, James R.; Smith, Dudley C.; Smith, Theo B., Jr.; and Morgan, Jerry N., to John E. Mitchell Company. Housing for expansion unit of cooling system. 4,082,142, Cl. 165-76.000.

Blasius, Udo: *See—*
Leiber, Heinz; and Blasius, Udo, 4,082,370, Cl. 303-92.000.

Blaupunkt-Werke GmbH: *See—*
Eschke, Bernd, 4,083,008, Cl. 325-163.000.

Bluhm, Elmer; and Vaas, Frederick T., Jr., to General Motors Corporation. Method of forming an injector valve nut seal. 4,081,890, Cl. 29-157.00C.

Blumenberg, Horst H., to Zenith Radio Corporation. Electron gun for cathode ray tube detachable from base support. 4,082,977, Cl. 313-457.000.

Blumig, Theodore: *See—*
Beede, Charles H.; and Blumig, Theodore, 4,082,705, Cl. 260-4.00R.

Boarini, Edward J.: *See—*
Rashid, Sheikh A.; Bray, Hugh S.; and Boarini, Edward J., 4,082,885, Cl. 428-281.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Braun, Klaus Joachim; and Siess, Hans Gunter Gerhard, 4,082,460, Cl. 356-85.000.

Boe, Hans; Hoehn, Ralf; Tecl, Bohuslav; and Kirsch, Wilhelm, to Carl Freudenberg, Firma. Absorbent textile sheet material. 4,082,878, Cl. 428-195.000.

Bohlinger, Arthur Leo: *See—*
Nakata, Roy; and Bohlinger, Arthur Leo, 4,082,933, Cl. 200-163.000.

Boise Cascade Corporation: *See—*
Hearon, William Montgomery; Witte, John F.; and Lo, Cheng Fan, 4,082,743, Cl. 536-30.000.

Bolhuis, Pieter Jan, to U.S. Philips Corporation. Gas discharge flash lamp with piezoelectric trigger generator. 4,082,985, Cl. 315-241.00P.

Bolton, Douglas R., to Cadaco, Inc. Game device. 4,082,278, Cl. 273-94.00R.

Bolton, Ivan Joseph; and Mercer, Alec Victor, to Sandoz Ltd. 1,3-Diphenyl-4 or 5-sulphoalkyl pyrazolines. 4,082,746, Cl. 260-239.900.

Bombardier, Emile: *See—*
Perreault, Jules; and Bombardier, Emile, 4,082,346, Cl. 296-84.00R.

Bombardier Limited: *See—*
Perreault, Jules; and Bombardier, Emile, 4,082,346, Cl. 296-84.00R.

Bonetti, Andrea: *See—*
Zardi, Umberto; Lagana', Vincenzo; Bonetti, Andrea; and Schmid, Giorgio, 4,082,797, Cl. 260-555.00A.

Boni, Richard R.; and Janubetz, Joseph J., to McGraw-Edison Company. Method of forming covers for electrical equipment. 4,081,900, Cl. 29-624.000.

Bonnamour, Yves B., to Southwire Company. Casting machine with translatable band. 4,082,136, Cl. 164-433.000.

Boosman, Frank Carlisle, to Piranha Products. Water powered waste disposal unit. 4,082,229, Cl. 241-46.00B.

Booth, Robert Edwin: *See—*
Eibeck, Richard Elmer; and Booth, Robert Edwin, 4,082,839, Cl. 423-489.000.

Borg-Warner Corporation: *See—*
Hechenbleikner, Ingenuin, 4,082,897, Cl. 428-426.000.

Boris, Michel. Atomized liquid dispensing pump. 4,082,222, Cl. 239-331.000.

Bornstein, Leopold F., to Georgia-Pacific Corporation. Control of precure in composition board manufacture. 4,082,904, Cl. 428-528.000.

Borom, Marcus P.: *See—*
Arendt, Ronald H.; Borom, Marcus P.; Huseby, Irvin C.; and Klug, Frederic J., 4,082,566, Cl. 134-2.000.

Borrevang, Poul; Guddal, Erling; Petersen, Henning Borge; Faarup, Peter; and Nielsen, Jorgen Ilum, to Novo Industri A/S. Process for the preparation of phosphorus derivatives of secondary ammonium salts of penam and cephem compounds. 4,082,745, Cl. 260-239.100.

Bortnichuk, Nikolai Iosifovich; Davydov, Valery Pavlovich; Krutyansky, Mikhail Mironovich; Malinovsky, Vladimir Sergeevich; and Khotin, Vladimir Alexeevich. Method of stabilizing arc voltage in plasma arc furnace and apparatus for effecting same. 4,082,914, Cl. 13-2.00P.

Bosshold, Barry L. Letter opener device. 4,081,907, Cl. 30-294.000.

Bounds, William E. Cheese grater and container. 4,082,230, Cl. 241-92.000.

Bourdon, Normand C.; Sanford, Richard; and Eifler, Raymond J., to Bendix Corporation, The. Electrical connector with front and rear insertable and removable contacts. 4,082,398, Cl. 339-59.00M.

Bourns, Inc.: *See—*
Fry, Stanley Eugene; and Hurd, Claude Calvert, 4,082,093, Cl. 128-142.200.

Bowler, Richard George: *See—*
Myers, Mark Stanley; and Bowler, Richard George, 4,082,294, Cl. 274-47.000.

Bowles, Romald E. Acceleration controlled fluidic shock absorber. 4,082,169, Cl. 188-322.000.

Boyd, Larry G.: *See—*
Grindley, C. Ronald; and Boyd, Larry G., 4,082,037, Cl. 101-425.000.

Bozsvai, Alex: *See—*
Simmons, Frank B.; Bozsvai, Alex; Kovacs, Louis A.; and Gerbetz, Robert P., 4,082,381, Cl. 308-187.000.

Brace, Neal O., to Ciba-Geigy Corporation. Perfluoroalkylthio norbornane compounds. 4,082,795, Cl. 260-544.00F.

Brace, Neal O., to Ciba-Geigy Corporation. Perfluoroalkylthio norbornane compounds. 4,082,798, Cl. 260-557.00B.

Bracuti, Arthur J.: *See—*
Satriana, Daniel R.; and Bracuti, Arthur J., 4,082,584, Cl. 149-109.400.

Bradley, Robert W.; Bray, Donald L.; and Peterson, Raymond L., to Bush Universal, Inc. Technique and articles for forming shoe shanks. 4,081,917, Cl. 36-76.00R.

Brandenstein, Manfred: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; Schurger, Rainer; Brandenstein, Manfred; and Burkl, Erich, 4,082,374, Cl. 308-6.00C.

Brandl, Ronald A.: *See—*
Valdespino, Joseph M.; and Brandl, Ronald A., 4,082,249, Cl. 254-45.000.

Brannegan, Daniel P.: *See—*
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,082,717, Cl. 260-345.90R.

Brannon, Donald R.; and Neuss, Norbert, to Eli Lilly and Company. Des-N-methylvindoline. 4,082,754, Cl. 260-287.00P.

Bratsos, Theodore. Manually operated hand drill. 4,082,473, Cl. 408-101.000.

Braun, Klaus Joachim; and Siess, Hans Gunter Gerhard, to Bodenseewerk Perkin-Elmer & Co., GmbH. Graphite tube for use in a flameless atomic absorption spectrometer. 4,082,460, Cl. 356-85.000.

Brax, Harri J.; Porinchak, Joseph F.; and Weinberg, Alan S., to W. R. Grace & Co. Process for melt extruding coating grade saran. 4,082,829, Cl. 264-209.000.

Bray, Donald L.: *See—*
Bradley, Robert W.; Bray, Donald L.; and Peterson, Raymond L., 4,081,917, Cl. 36-76.00R.

Bray, Hugh S.: *See—*
Rashid, Sheikh A.; Bray, Hugh S.; and Boarini, Edward J., 4,082,885, Cl. 428-281.000.

Break, Douglas G., to American Industrial Products, Inc. Wide-range sheet material bending brake. 4,081,986, Cl. 72-320.000.

Brearley Company, The: *See—*
Pillote, Vernon J., 4,082,154, Cl. 177-211.000.
Provi, Mike A., 4,082,153, Cl. 177-177.000.

Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., to Pfizer Inc. Preparation of gamma-pyrones. 4,082,717, Cl. 260-345.90R.

Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Ball game with alignable apertures. 4,082,268, Cl. 273-1.00R.

Bressler, David E., to Amerace Corporation. Male contact assembly for loadbreak usage. 4,082,403, Cl. 339-111.000.

Bretfeld, Anton: *See—*
Bendler, Hellmut; and Bretfeld, Anton, 4,081,964, Cl. 60-636.000.

Bretting, Claus Aage Svensgaard: *See—*
Feit, Peter Werner; Nielsen, Ole Bent Tvaermose; Bruun, Herta; and Bretting, Claus Aage Svensgaard, 4,082,851, Cl. 424-300.000.

Breuer, David R., to TRW Inc. High speed monolithic A/D converter utilizing strobe comparator. 4,083,043, Cl. 340-347.0AD.

Brewer, John C., to Garbalizer Corporation of America. Shredder structure. 4,082,232, Cl. 241-236.000.

Bridgestone Tire Company Limited: *See—*
Arai, Tatsuo; Hirano, Hironori; Kajimura, Hiroyuki; and Matsui, Masayuki, 4,082,132, Cl. 152-361.00R.

Brigham, Ward E., to Sun Chemical Corporation. Plate making system. 4,082,455, Cl. 355-100.000.

Brinkschroder, Franz-Jurgen; Sandquist, Axel; and Johannaber, Friedrich, to Bayer Aktiengesellschaft. Apparatus for the extrusion of temperature sensitive thermoplastics. 4,082,488, Cl. 425-204.000.

Brisabois, Roger: *See—*
Lalin, Andre; and Brisabois, Roger, 4,082,171, Cl. 192-70.200.

Bristol-Myers Company: *See—*
Juby, Peter Frederick; and Partyka, Richard Anthony, 4,082,751, Cl. 260-256.40C.
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, 4,082,912, Cl. 544-26.000.

British Aircraft Corporation Limited: *See—*
Guest, Ashley W., 4,083,014, Cl. 331-1.00A.

British Leyland UK Limited: *See—*
Anderson, James, 4,082,344, Cl. 296-28.00C.

British Petroleum Company Limited, The: *See—*
Goldie, Brian Peter Forsyth, 4,082,692, Cl. 252-429.00B.
Harvey, Lawrence, 4,082,082, Cl. 126-271.000.

Brock, Andrew J.: *See—*
Anthony, William H.; Brock, Andrew J.; and Gullotti, Damian V., 4,082,574, Cl. 148-2.000.

Brodsky, Larry: *See—*
Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; Seipos, Andrew G.; and Castillo, Adolfo, 4,081,893, Cl. 29-432.000.

Brooks, Robert Ellison; and Winter, Donald Charles, to TRW Inc. Holographic lens array and method for making the same. 4,082,415, Cl. 350-3.830.

Brown, Daniel Maitland, to University of California, Regents of the. Neuston net apparatus. 4,082,055, Cl. 114-245.000.

Brown, Herbert C., to Aldrich-Boranes, Inc. Bulky trialkylborohydrides. 4,082,810, Cl. 260-606.50B.

Brown, Robert A., to Minnesota Mining and Manufacturing Company. Retroreflective sheeting with retroreflective markings. 4,082,426, Cl. 350-105.000.

Brummelhuis, Johannes Arnold Julius, to Stork Amsterdam B.V. Rotatable atomizer for spraying a liquid. 4,082,221, Cl. 239-214.250.

Bruner, Frank D. Docking and mooring device for a boat. 4,082,054, Cl. 114-230.000.

Brunswick Corporation: *See—*
Hale, David Jerry, 4,082,068, Cl. 123-41.020.

Brusa, Ugo. Heat exchanger and application thereof to realize an ore reducing furnace. 4,082,254, Cl. 266-175.000.

Bruun, Herta: *See—*
Feit, Peter Werner; Nielsen, Ole Bent Tvaermose; Bruun, Herta; and Bretting, Claus Aage Svensgaard, 4,082,851, Cl. 424-300.000.

Bryson, Cecil Walsh, to Canadian Brass Limited. Compressible member for use in compression joint pipe connector. 4,082,326, Cl. 285-238.000.

Buchan, William A.; and Rotter, Gerhard, to BASF Aktiengesellschaft. Safety picker for magnetic tape leader. 4,082,237, Cl. 242-192.000.

Buda, Salvatore: *See—*
Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, 4,082,319, Cl. 285-27.000.

Budzich, Tadeusz. Load responsive fluid control valve. 4,082,111, Cl. 137-596.000.

Buechner, Oskar; Schlichthaerle, Gottfried; and Urban, Friedrich, to BASF Aktiengesellschaft. Multi-stage isolation of high pressure polyethylene. 4,082,910, Cl. 528-481.000.

Bunker Ramo Corporation: *See—*
Nijman, John Peter, 4,083,022, Cl. 333-79.000.

Burg, Karlheinz; and Schlaf, Helmut, to Hoechst Aktiengesellschaft. Process for the preparation of oxymethylene polymers. 4,082,729, Cl. 260-67.0FP.

Burgsdorf, Vladimir Vladimirovich; Genrikh, Georgy Andreevich; Nikonets, Leonid Alexeevich; Mishin, Valery Vasilievich; Kuznetsov, Viktor Yakovlevich; and Kondratiev, Anatoly Dmitrievich. Device for melting the icing by direct current on conductors of overhead power transmission line. 4,082,962, Cl. 307-147.000.

Burgtorf, James R.: *See—*
Chou, Ta-Sen; and Burgtorf, James R., 4,082,766, Cl. 260-326.0HL.

Burkey, John Brent. Chock for mountain climbing. 4,082,241, Cl. 248-1.000.

Burkl, Erich: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; Schurger, Rainer; Brandenstein, Manfred; and Burkl, Erich, 4,082,374, Cl. 308-6.00C.

Burlington Industries, Inc.: *See—*
Malpass, Robert C.; Illman, Walter F.; and Conklin, Delano M., 4,082,883, Cl. 428-253.000.

Burr-Brown Research Corporation: *See—*
Vanaglash, John J., Jr., 4,082,908, Cl. 428-672.000.

Burroughs Corporation: *See—*
Looschen, Floyd William, 4,083,005, Cl. 325-38.00A.
Looschen, Floyd William, 4,083,010, Cl. 325-321.000.
Paulinski, Ronald Adam, 4,082,218, Cl. 235-304.000.

Burton, Arthur; and Reed, David Robert, to Imperial Chemical Industries Limited. Decorative sheet material. 4,082,890, Cl. 428-328.000.

Burton, Lawrence; and Friedman, Frank, to Immunology Research Foundation, Inc. Deblocking protein fraction recovery method and product. 4,082,732, Cl. 260-112.00B.

Burton, Lawrence; and Friedman, Frank, to Immunology Research Foundation, Inc. Blocking protein fraction recovery method and product. 4,082,733, Cl. 260-112.00B.

Busch, Rudolf; Ganter, Wolfgang; and Ginter, Albert, to Gebruder Junghans GmbH. Watch module for use with separate power source. 4,081,952, Cl. 58-50.00R.

Buschow, Kurt Heinz Jurgen: *See—*
Miedema, Andries Rinse; Buschow, Kurt Heinz Jurgen; and Mulder, Jan, 4,082,138, Cl. 165-4.000.

Bush Universal, Inc.: *See—*
Bradley, Robert W.; Bray, Donald L.; and Peterson, Raymond L., 4,081,917, Cl. 36-76.00R.

Butcher, Alan George, to Dresser Europe S. A. Air eliminator valve. 4,082,106, Cl. 137-174.000.

Butler, David R.: *See—*
Gibson, David L.; Barrett, Lawrence J.; Moore, Patricia A.; and Butler, David R., 4,082,390, Cl. 312-284.000.

Butterworth, George A. M.; and Elias, Robert T., to Johnson & Johnson. Liquid absorbent fibrous material and method of making the same. 4,082,886, Cl. 428-284.000.

Buttner-Schilde-Haas Aktiengesellschaft: *See—*
Offergeld, Egon; and Wischniewski, Martin, 4,082,498, Cl. 432-14.000.

BWG Bergwerk- und Walzwerk-Maschinenbau GmbH: *See—*
Manthey, Willi Bruno; and Deiwick, Horst, 4,082,100, Cl. 134-76.000.

C. H. Heist Corporation: *See—*
Keeney, Joseph G., 4,082,104, Cl. 137-71.000.

C. H. Stuart Inc.: *See—*
Gibson, David L.; Barrett, Lawrence J.; Moore, Patricia A.; and Butler, David R., 4,082,390, Cl. 312-284.000.

Cackley, George W.: *See—*
Krolak, Ronald L.; Cackley, George W.; Getz, Marvin G.; and Ritter, Arthur J., Jr., 4,082,156, Cl. 180-9.620.

Cadaco, Inc.: *See—*
Bolton, Douglas R., 4,082,278, Cl. 273-94.00R.

Cadiou, Jean, to Societe Anonyme Automobiles Citroen. Method and control device for switch means adapted to modify the coupling of groups of elements of an electrochemical generator supplying an electro motor. 4,082,987, Cl. 318-139.000.

Calvert, Rodney K.; and Landrum, Charles Rabun, to Mead Corporation, The. Packaging machine for use with cartons of different sizes with minimum adjustment. 4,081,945, Cl. 53-186.000.

Cam-Stat Incorporated: *See*—
Dahlgren, Vincent M. F., 4,082,493, Cl. 431-25.000.
Camin, Leopoldo Lazaro: *See*—
Adler, Norman; and Camin, Leopoldo Lazaro, 4,082,840, Cl. 424-1.000.
Campbell, John A. L.; and Moynihan, Daniel J., to Peabody Coal Company. Mining apparatus and method. 4,082,360, Cl. 299-33.000.
Campbell, Robert T.: *See*—
DeRosa, Robert J.; and Campbell, Robert T., 4,083,048, Cl. 343-7.300.
Canada-Cities Service, Ltd.: *See*—
Flynn, Peter Charles, 4,082,646, Cl. 208-11.00R.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Anderton, William Arthur; and Sewell, Richard Benjamin Hollis, 4,082,588, Cl. 156-71.000.
Canadian Brass Limited: *See*—
Bryson, Cecil Walsh, 4,082,326, Cl. 285-238.000.
Canadian General Electric Company Limited: *See*—
Szymanis, Edward, 4,081,947, Cl. 56-13.300.
Canadian Patents and Development Limited: *See*—
Chow, Suezone, 4,082,903, Cl. 428-514.000.
Litvan, Gerhard G.; and Sereda, Peter J., 4,082,562, Cl. 106-97.000.
Rangi, Rajindar S.; and South, Peter, 4,082,479, Cl. 416-23.000.
Canon Kabushiki Kaisha: *See*—
Tsunekawa, Tokuichi; Nakamura, Zenso; Taguchi, Tetsuya; Uchidoi, Masanori; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,083,059, Cl. 354-149.000.
Cantoni, Gianfranco: *See*—
Lo Scalzo, Enzo; Ferre, Franco; and Cantoni, Gianfranco, 4,082,714, Cl. 260-29.70R.
Capes, C. Edward; McIlhinney, Allen E.; and Messer, Leonard, to American Minechem Corporation. Coke oven system and agglomerating carryover fines therein. 4,082,515, Cl. 23-313.00R.
Carbonoyl Company: *See*—
Metzger, Grant W., 4,082,516, Cl. 44-51.000.
Carborundum Company, The: *See*—
Conklin, James T.; Daley, Daniel R.; and Geyer, Raymond K., 4,082,567, Cl. 134-10.000.
McGarvey, Jarvis M., 4,082,521, Cl. 51-295.000.
Carl Freudenberg, Firma: *See*—
Boe, Hans; Hoehn, Ralf; Tecl, Bohuslav; and Kirsch, Wilhelm, 4,082,878, Cl. 428-195.000.
Schilling, Hermann; and Seifert, Heinz, 4,082,160, Cl. 181-258.000.
Carl Zeiss-Stiftung: *See*—
Keydell, Willi; and Binder, Herbert, 4,082,418, Cl. 350-10.000.
Carlqvist, Bengt Roland; and Eriksson, Anders Gunnar, to Telefonaktiebolaget L M Ericsson. Reference signal circuit in a receiver for detecting two frequencies in a multifrequency tone signal. 4,082,924, Cl. 179-84.0VF.
Carlson, Bayard L., to AMFAC Foods, Inc. Means and method for packaging frangible articles. 4,082,187, Cl. 206-585.000.
Carmeron Iron Works, Inc.: *See*—
Allen, Herbert, 4,082,105, Cl. 137-72.000.
Carol, John A., Jr.; Paxton, Wayne E.; and Riddel, John W., to General Motors Corporation. Differential pressure power road speed control system. 4,082,158, Cl. 180-108.000.
Carr, Robert Joseph: *See*—
Hermanson, Gerald Peter; Rickel, David Murray; and Carr, Robert Joseph, 4,081,894, Cl. 29-433.000.
Carre, Gerard: *See*—
Parmentier, Jean; Saurais, Jacques; and Carre, Gerard, 4,082,383, Cl. 308-194.000.
Carris, George M.: *See*—
Coley, Kenneth R.; and Carris, George M., 4,082,396, Cl. 339-36.000.
Carson, Chester C.: *See*—
Barton, Sterling C.; Carson, Chester C.; and Echeverria, Federico S., 4,082,948, Cl. 250-304.000.
Castillo, Adolfo: *See*—
Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; Seipos, Andrew G.; and Castillo, Adolfo, 4,081,893, Cl. 29-432.000.
Castleman, Cordell V., to Magnetic Controls Company. Telephone testing equipment. 4,082,920, Cl. 179-2.0DP.
Caterpillar Mitsubishi Ltd.: *See*—
Kozuki, Naoto, 4,082,372, Cl. 305-57.000.
Caterpillar Tractor Co.: *See*—
Krolak, Ronald L.; Cackley, George W.; Getz, Marvin G.; and Ritter, Arthur J., Jr., 4,082,156, Cl. 180-9.620.
Mangus, Ervin E., 4,082,224, Cl. 239-453.000.
Ritter, Arthur J.; and Deck, James R., 4,082,170, Cl. 192-13.00R.
Sly, William Porter; and Ringel, Reginald Karl, 4,082,299, Cl. 277-82.000.
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Caulfield, Patrick J.: *See*—
Jensen, Gerald A.; Harvey, Ronald B.; Caulfield, Patrick J.; Putzke, Dwayne H.; and Strunc, Gerald R., 4,082,943, Cl. 235-303.100.
CAV Limited: *See*—
Fenne, Ivor, 4,082,481, Cl. 417-403.000.
Cavagnero, Erman V.: *See*—
Lampietti, Bernard P.; and Cavagnero, Erman V., 4,082,935, Cl. 219-9.500.
Cavitt, Roy L.: *See*—
Miller, Richard G.; and Cavitt, Roy L., 4,082,898, Cl. 428-427.000.
Ceel-Co: *See*—
Van Ausdall, James G., 4,081,941, Cl. 52-726.000.
Central Specialties, Inc.: *See*—
Ballenger, William, 4,082,349, Cl. 297-183.000.
Centre Experimental de Recherches et d'Etudes du Batiment et des Travaux Publics: *See*—
Majcherczyk, Richard, 4,081,989, Cl. 73-9.000.
Cerano, Leon R.; and Reichardt, Mayo M., to General Motors Corporation. Apparatus for in-the-mold coating of molded articles. 4,082,486, Cl. 425-129.00R.
Champion Spark Plug Company: *See*—
Lentz, Lawrence R., 4,082,976, Cl. 313-135.000.
Chang, Kuang-Chou; Heller, Adam; and Miller, Barry, to Bell Telephone Laboratories, Incorporated. Photovoltaic cell manufacture. 4,082,602, Cl. 156-627.000.
Chang, Roland Wan-chan; and Graves, Charles A. Audio analgesic unit. 4,082,918, Cl. 179-1.0AA.
Chang, Wen-Hsuan, to PPG Industries, Inc. Method of curing B-stage polyurethanes. 4,082,634, Cl. 204-159.150.
Change, Nicholas D.; and Riggs, Michael T., to PCB Piezotronics, Inc. Pressure transducer calibration. 4,081,988, Cl. 73-4.00R.
Chappatte, Jean-Maurice, to Ebauches S.A. Calendar mechanism for timepiece. 4,081,950, Cl. 58-4.00R.
Charles Churchill Limited: *See*—
Hodgson, Brian; Fairnington, Robert; Thorneycroft, Malcolm; and Grant, Ronald Malcolm, 4,082,031, Cl. 90-4.000.
Chatagnier, John C. Hydraulic pipe testing apparatus. 4,081,990, Cl. 73-40.50R.
Chateau, Jacques, to Compagnie Generale des Etablissements Michelin. Apparatus for molding a tire molding bladder. 4,082,490, Cl. 425-412.000.
Chemcast Corporation: *See*—
Rubright, Phillip L., 4,081,879, Cl. 16-2.000.
Chemed Corporation: *See*—
Wolfe, Court Lone, 4,082,459, Cl. 356-85.000.
Chen, James Ling; and Battaglia, Jean M., to E. R. Squibb & Sons, Inc. Topical and other type pharmaceutical formulations containing isosorbide carrier. 4,082,881, Cl. 424-241.000.
Chen, Jong C., to Mallinckrodt, Inc. Chemical process. 4,082,747, Cl. 260-239.570.
Chen, Leighton L., to Loew's Theatres, Inc. Calibration assembly for infrared moisture analyzer. 4,082,950, Cl. 250-343.000.
Chen, Ping F. Shuttle article for games. 4,082,281, Cl. 273-106.00A.
Cheng, Richard C. M.; Dennis, Gene Patrick; and Stewart, Robert M., to Tyco Industries, Inc. Model roadway track construction. 4,082,220, Cl. 238-10.00F.
Cherny, Iosif Semenovich; and Mischenko, Mikhail Vasilievich. Contact spring pile-up assembly. 4,083,023, Cl. 335-135.000.
Cherry, Thomas Adrian: *See*—
Keller, Alex J.; Dellinger, Keith Sidney; Ray, James Lester, Jr.; Cherry, Thomas Adrian; and Fechner, Erhard A., 4,081,949, Cl. 57-53.000.
Chevron Research Company: *See*—
Tamm, Paul W., 4,082,697, Cl. 252-466.0PT.
Chia, Enrique C.: *See*—
Schoerner, Roger J.; and Chia, Enrique C., 4,082,573, Cl. 148-2.000.
Chirumbolo, Frank, to Raymond Lee Organization, Inc., The, a part interest. Portable cleaning tools. 4,082,186, Cl. 206-577.000.
Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, to Allied Chemical Corporation. Removal of SO_2 from gases. 4,082,835, Cl. 423-242.000.
Chlystun, Walter K. Process for blow molding of a spout container. 4,082,827, Cl. 264-98.000.
Chomet, Marc, to Teleglobe Pay-TV System, Inc. Automatic subscriber interrogation system. 4,082,921, Cl. 179-2.00A.
Chou, Ta-Sen; and Burgtorf, James R., to Eli Lilly and Company. Process for preparing n-chlorophthalimide. 4,082,766, Cl. 260-326.0HL.
Chow, Suezone, to Canadian Patents and Development Limited. Tree foliage extenders and fillers for wood adhesives. 4,082,903, Cl. 428-514.000.
Chrones, Anthony, to Reliance Products Corporation. Safety cover for a door knob. 4,082,351, Cl. 297-347.000.
Chrysler Corporation: *See*—
Ghosh, Subrata, 4,082,581, Cl. 148-32.000.
Kuusik, Uno, 4,082,103, Cl. 137-54.000.
Chu, Wesley W. Statistical multiplexing system for computer communications. 4,082,922, Cl. 179-15.0BA.
Chung, Jackson, to Reliance Electric Company. Motorized conveyor pulley. 4,082,180, Cl. 198-835.000.
Ciba-Geigy AG: *See*—
Seitz, Karl, 4,082,739, Cl. 260-146.00T.
Ciba-Geigy Corporation: *See*—
Brace, Neal O., 4,082,795, Cl. 260-544.00F.
Brace, Neal O., 4,082,798, Cl. 260-557.00B.
Fritz, Andre; and Dunn, Barbara Lee, 4,082,635, Cl. 204-159.230.
Hoegerle, Karl; and Berrer, Dagmar, 4,082,535, Cl. 71-92.000.
Jost, Max; and Wick, Arnold, 4,082,778, Cl. 260-378.000.
Renner, Alfred; and Haug, Theobald, 4,082,768, Cl. 260-326.260.
Schmidt, Andreas; and Kirchmayr, Rudolf, 4,082,821, Cl. 260-946.000.
Cilento, Guido D., to AMF Incorporated. Filter asembly with integral service shut-off valve. 4,082,673, Cl. 210-234.000.
Cincinnati Milacron Inc.: *See*—
Gibbemeyer, Joseph Franz, 4,082,175, Cl. 198-377.000.

Cineffects Color Laboratory Inc.: *See—*
Pascuzzi, Louis Ferdinand, 4,082,447, Cl. 355-30.000.
Citron, Samuel. Tape having a longitudinal strip of adhesive which is useful as a means for framing sheets. 4,082,875, Cl. 428-134.000.
Citti, James E.; and Dienst, Carl S., to Ore-Ida Foods, Inc. Process for producing a french fried potato product. 4,082,855, Cl. 426-250.000.
Clark Equipment Company: *See—*
Saunders, Lawrence Allan, 4,082,377, Cl. 308-15.000.
Clark, Gordon W.: *See—*
Baker, Jack M.; Clark, Gordon W.; Harper, Douglas M.; and Tomlinson, Leroy O., 4,081,956, Cl. 60-39.18B.
Clark, Lealand L., to University of Utah. Method for treating psoriasis. 4,082,846, Cl. 424-266.000.
Clarke, John W., to Eli Lilly and Company. Carton and bag container. 4,082,216, Cl. 229-55.000.
Clarke, William Leslie. Wall constructions. 4,081,969, Cl. 61-39.000.
Cleffman, Roger G.: *See—*
Raabe, Ralph C.; Cleffman, Roger G.; and Stratton, Raymond G., 4,082,592, Cl. 156-153.000.
Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,082,572, Cl. 148-1.500.
Clymer, Wilbur L.; and Klara, Charles J., to Binney & Smith Inc. Automated molding machine. 4,082,491, Cl. 425-440.000.
Coaltex, Inc.: *See—*
Justice, James Conley; and Delli-Gatti, Frank A., Jr., 4,082,362, Cl. 299-57.000.
Coates, Don Mayo, to Du Pont de Nemours, E. I., and Company. Coating composition for a fibrous nonwoven sheet of polyolefin. 4,082,887, Cl. 428-289.000.
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, to Smith Kline & French Laboratories Limited. 3-(3-(3-Substituted amino-2-hydroxypropoxy)phenyl)-6-hydrazino pyridazines and their use as vasodilators and β-adrenergic blocking agents. 4,082,843, Cl. 424-250.000.
Coats & Clark, Inc.: *See—*
Toepelt, Werner; and Bernier, Richard, 4,081,882, Cl. 24-205.00R.
Coca-Cola Company, The: *See—*
Day, Gerald Glynn, 4,082,044, Cl. 105-376.000.
Cockroft, James B.: *See—*
Sukow, Daniel L.; Smith, Richard A.; and Cockroft, James B., 4,082,941, Cl. 219-243.000.
Coffey, Gerald P.; and Mazeke, Herbert F., to Standard Oil Company, The. Mercaptan activation by acid in the copolymerization of acrylonitrile. 4,082,818, Cl. 260-879.000.
Cogliano, Joseph A., to W. R. Grace & Co. Process of forming a protective coating and shipping the coating from the surface being protected when no longer required. 4,082,830, Cl. 264-213.000.
Cohn, Marvin, to Westinghouse Electric Corporation. Expendable repeater employing harmonic mixing. 4,083,004, Cl. 325-6.000.
Cole, Victor L.; and Perry, Kenneth D. Hydraulic brake system for gooseneck trailers. 4,082,168, Cl. 188-112.00R.
Coley, Kenneth R.; and Carris, George M., to Westinghouse Electric Corporation. Shield for bus bar stabs. 4,082,396, Cl. 339-36.000.
Colgate-Palmolive Company: *See—*
Bauman, Robert Andrew, 4,082,756, Cl. 260-293.530.
Inamorato, Jack Thomas; and Salmen, Leo Augustus, 4,082,682, Cl. 252-92.000.
Colvin, Kenneth W.: *See—*
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Cominco Ltd.: *See—*
Milner, Edward F. G.; Parker, Ernest G.; and Swinkels, Godefridus M., 4,082,629, Cl. 204-66.000.
Compagnie Generale des Etablissements Michelin: *See—*
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Compton, Leslie E.; and Rowan, William H., to Occidental Oil Shale, Inc. Low temperature oxidation of hydrogen sulfide in the presence of oil shale. 4,082,146, Cl. 166-259.000.
Compton, Thomas A.: *See—*
Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., 4,082,868, Cl. 427-329.000.
Conder, Terrence M.; and O'Leary, Kevin P., to Minnesota Mining and Manufacturing Company. Stabilized transparent receptor sheet. 4,082,879, Cl. 428-219.000.
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Malpass, Robert C.; Illman, Walter F.; and Conklin, Delano M., 4,082,883, Cl. 428-253.000.
Conklin, James T.; Daley, Daniel R.; and Geyer, Raymond K., to Carborundum Company, The. Method for thermally killing roots in sewer lines. 4,082,567, Cl. 134-10.000.
Constant, James Nickolas. Superconducting energy system. 4,082,991, Cl. 320-1.000.
Continental Oil Company: *See—*
Li, Ke Wen, 4,082,650, Cl. 208-131.000.
Continental Water Conditioning Corporation: *See—*
Jones, Charles L.; and Aradio, Dominic, 4,082,666, Cl. 210-93.000.
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Jones, Donald H., 4,082,968, Cl. 310-68.00B.
Conver Ingenieur-Technik GmbH & Co., KG: *See—*
Looks, Arnold, 4,082,052, Cl. 114-75.000.
Cook Paint and Varnish Company: *See—*
Fisk, William W.; and Wright, Howard J., 4,082,816, Cl. 260-855.000.
Corbett, Roger Patrick; Gilson, Trevor Robert; Nealon, Terence Patrick; and Hendra, Patrick John, to Edward Curran Engineering Limited. Electrostatic deposition of fine vitreous enamel. 4,082,860, Cl. 427-27.000.
Cordes, Henry P., to Basic Vegetable Products, Inc. Apparatus for separating food articles from field debris. 4,082,189, Cl. 209-73.000.
Cordes, Walter John: *See—*
Bassett, Robert James; Cordes, Walter John; and Fuchs, Julius Jakob, 4,082,787, Cl. 260-453.00P.
Cormier, Joseph Tilmon. Cable stripper. 4,081,903, Cl. 30-90.600.
Cotton, Neil Trevor, to Imperial Chemical Industries Limited. Continuous fermentation process. 4,082,611, Cl. 195-28.00R.
Couderc, Pierre; and Hilmoine, Serge, to Societe Chimique des Charbonnages. Preparation of D, L-pantolactone. 4,082,775, Cl. 260-343.600.
Country Queen Foods, Inc.: *See—*
Zwiep, Theodore Carl; Newhouse, Donn G.; and Craner, Jerry D., 4,082,856, Cl. 426-299.000.
Cox, George Benjamin, Jr., to United Technologies Corporation. Premixed combustor. 4,081,957, Cl. 60-39.360.
Cox, Randal A. Hay bale pickup and transport device. 4,082,192, Cl. 214-1.0HA.
Craig, Paul George, to Dresser Industries, Inc. Removable drill bit nozzle. 4,082,015, Cl. 76-108.00A.
Craner, Jerry D.: *See—*
Zwiep, Theodore Carl; Newhouse, Donn G.; and Craner, Jerry D., 4,082,856, Cl. 426-299.000.
Crawford, Duncan J.; and Santiago, Gonzalo D., to Ex-Cell-O Corporation. High capacity quiet burner for hot air heating system. 4,082,497, Cl. 431-158.000.
Crimpfil Limited: *See—*
Holden, Gordon Alan, 4,081,887, Cl. 28-271.000.
Crompton & Knowles Corporation: *See—*
Nims, Philip A., 4,082,118, Cl. 139-144.000.
Croome, Ronald John, to P. Leiner & Sons Limited. Gelatin composition. 4,082,857, Cl. 426-573.000.
Crosby, Jeffrey Norman, to International Nickel Company, Inc., The. Electrodeposition of ruthenium. 4,082,625, Cl. 204-47.000.
Crouse-Hinds Company: *See—*
Perretta, Michael L., 4,082,141, Cl. 165-69.000.
Crutcher, William C., to Timex Corporation. Hybrid horological display using space modulation. 4,081,953, Cl. 58-50.00R.
CTS Corporation: *See—*
Hufford, James N., 4,082,925, Cl. 200-11.00G.
Cukrowski, Georg, to U.S. Philips Corporation. Automatic record player mechanism for turntable speed and pick-up arm position adjustment. 4,082,290, Cl. 274-9.00A.
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Culpepper & Associates, Inc.: *See—*
Culpepper, Bertram C., Jr.; and Wilson, Richard C., 4,081,939, Cl. 52-535.000.
Culpepper, Bertram C., Jr.; and Wilson, Richard C., to Culpepper & Associates, Inc. Siding panel backerboard and method of manufacturing same. 4,081,939, Cl. 52-535.000.
Curet, Harvey Donald, to Energy, Inc. Cooling of pressurized water nuclear reactor vessels. 4,082,608, Cl. 176-61.000.
Curry, Herbert Leard; and Hall, Walter Lawrence, to General Electric Company. Polycarbonate coated with photocurable polythiol and different polyenes. 4,082,891, Cl. 428-412.000.
Curtis, Henry H., Jr.: *See—*
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Cutler-Hammer, Inc.: *See—*
Piber, Earl T., 4,082,934, Cl. 200-315.000.
Cutters Machine Company, Inc.: *See—*
Smith, Hoyt L., 4,082,258, Cl. 270-31.000.
D. M. Scott & Sons Company: *See—*
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Daclon, Ferruccio: *See—*
Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, 4,081,895, Cl. 29-573.000.
Dahlgren, Vincent M. F., to Cam-Stat Incorporated. Gas burner control system. 4,082,493, Cl. 431-25.000.
Daiichi Denshi Kogyo Kabushiki Kaisha: *See—*
Furuya, Kiyoto, 4,082,618, Cl. 204-15.000.
Daikin Kogyo Co., Ltd.: *See—*
Takahara, Takao; and Misaki, Susumu, 4,082,752, Cl. 260-260.000.
Dailey, Calvin L. Locking device for intravenous insert. 4,082,094, Cl. 128-214.00R.
Daimler-Benz Aktiengesellschaft: *See—*
Hutai, Hubert; Klie, Wolfgang; and Weisshappel, Helmut, 4,082,338, Cl. 293-85.000.
Renner, Hermann; and Wacker, Siegfried, 4,082,354, Cl. 297-410.000.
Saufferer, Helmut; and Willmann, Karl, 4,082,070, Cl. 123-119.00E.
Tomforde, Johann, 4,082,350, Cl. 297-243.000.
Daito Seimo Coshi Kaisha: *See—*
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Daley, Daniel R.: *See—*
Conklin, James T.; Daley, Daniel R.; and Geyer, Raymond K., 4,082,567, Cl. 134-10.000.
Dalli, Francis J. Buoy type oil gate. 4,082,674, Cl. 210-242.00S.
Dalton, Thomas B., to Westran Corporation. Valve actuator. 4,082,247, Cl. 251-229.000.

Dancy, Edna A.; and Vansant, James H., to Hydro-Quebec. Fabrication of ceramic heat pipes. 4,082,863, Cl. 427-181.000.

Danford, Glenn S.: *See—*
Day, Willis E.; Danford, Glenn S.; and Johnson, Kenneth C., 4,082,919, Cl. 179-2.0EA.

Danfoss A/S: *See—*
Andresen, Jens Nicolai, 4,082,928, Cl. 200-67.0DA.
Stove, Flemming, 4,081,963, Cl. 60-528.000.
Thorsen, Niels Peter, 4,082,929, Cl. 200-83.0SA.

Danielson, Arthur C., to Uniroyal, Inc. Non-staining antiozonant enamines. 4,082,706, Cl. 260-5.000.

Dannels, Bobby F., to Hooker Chemicals & Plastics Corporation. Process for curing sulfhydryl-terminated thioether polymers. 4,082,712, Cl. 260-28.00R.

Dansk Industri Syndikat A/S: *See—*
Petersen, Carl Herbert; and Gunnergaard, Marius, 4,082,135, Cl. 164-404.000.

Datron Systems, Inc.: *See—*
Rover, Jack T., 4,083,024, Cl. 335-136.000.

Dauvergne, Hector A. Pole-less fishing rig. 4,082,235, Cl. 242-84.20J.

David Kopf Systems: *See—*
Seiler, William, Jr., 4,082,667, Cl. 210-96.00M.

Davis, Leonard C., to General Motors Corporation. Regenerator drive assembly. 4,082,139, Cl. 165-8.000.

Davis, Thomas R. Vehicle console for mounting and enclosing radios and the like. 4,082,387, Cl. 312-242.000.

Davis, William F., to Motorola, Inc. Input quarter cycle timing circuit. 4,082,075, Cl. 123-148.00E.

Davydov, Valery Pavlovich: *See—*
Bortnichuk, Nikolai Iosifovich; Davydov, Valery Pavlovich; Krutyansky, Mikhail Mironovich; Malinovsky, Vladimir Sergeevich; and Khotin, Vladimir Alexeevich, 4,082,914, Cl. 13-2.00P.

Dawson, Raymond B., to Super Stud Products, Inc. Locking fastener assembly. 4,081,979, Cl. 70-58.000.

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Day, Oliver E. Twin ignition and twin electrical start system for a vehicle. 4,082,992, Cl. 320-6.000.

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Dayron Corporation: *See—*
Hermanson, Gerald Peter; Rickel, David Murray; and Carr, Robert Joseph, 4,081,894, Cl. 29-433.000.

De Candida, Cristiano: *See—*
Malgarini, Giansilvio; Pasero, Edoardo; Alitta, Giorgio; De Candida, Cristiano; and Raggio, Carlo, 4,082,545, Cl. 75-35.000.

Deck, James R.: *See—*
Ritter, Arthur J.; and Deck, James R., 4,082,170, Cl. 192-13.00R.

Deere & Company: *See—*
Werner, Gregory Keith; Switzer, Kenneth Oscar; and St. Laurent, Raymond G., 4,082,371, Cl. 305-56.000.

deGeus, Arie M. Solar operated turbine power generator. 4,081,965, Cl. 60-641.000.

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Dehait, Jack T.; Dietz, David C.; Snyder, Milo S.; and Talor, Francis M., to Systems Research Laboratories, Inc. Calibrated optical micrometer. 4,082,463, Cl. 356-167.000.

Dehnert, Heinz. Method of forming a comb-like electrode structure. 4,082,619, Cl. 204-15.000.

Deiwick, Horst: *See—*
Manthey, Willi Bruno; and Deiwick, Horst, 4,082,100, Cl. 134-76.000.

Del Carpio, Bernardo, to Planiblock, S.A. Method of producing continuous planar expanded polyurethane blocks. 4,082,824, Cl. 264-46.300.

Del Castillo, Juan M.: *See—*
Rumer, David Orville, Jr.; Findlay, Donald James; Neumann, Arthur E.; and Del Castillo, Juan M., 4,082,029, Cl. 84-484.000.

Delle-Alsthom S.A.: *See—*
Rozier, Paul; Niel, Pierre; and Ferlay, Jean, 4,082,932, Cl. 200-148.00R.

Delli-Gatti, Frank A., Jr.: *See—*
Justice, James Conley; and Delli-Gatti, Frank A., Jr., 4,082,362, Cl. 299-57.000.

Dellinger, Keith Sidney: *See—*
Keller, Alex J.; Dellinger, Keith Sidney; Ray, James Lester, Jr.; Cherry, Thomas Adrian; and Fechner, Erhard A., 4,081,949, Cl. 57-53.000.

De Long, Charles F., to United States Trading International, Inc. Method of reducing fouling of marine structures and coated structure thereof. 4,082,884, Cl. 428-262.000.

Delta Truck Body Company, Inc.: *See—*
Weinstein, Hyman; and Adler, Kurt, 4,082,882, Cl. 428-246.000.

De Luca, John A.: *See—*
Yang, Kei-Hsiung; and De Luca, John A., 4,083,018, Cl. 331-94.50F.

Denamps, Jean; and LeCossec, Jean, to Robert Bosch GmbH. Pneumatically operated pressure switch, particularly for vehicle tire supervision. 4,082,960, Cl. 307-118.000.

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Nakagawa, Koji; and Hirano, Kenkiti, 4,082,561, Cl. 106-89.000.

Denman, Stephen A.: *See—*
Mendelson, Barry; and Denman, Stephen A., 4,082,095, Cl. 128-235.000.

Dennis, Gene Patrick: *See—*
Cheng, Richard C. M.; Dennis, Gene Patrick; and Stewart, Robert M., 4,082,220, Cl. 238-10.00F.

Depoitier, Jacques; and Vinchent, Romain, to Institut National des Radio-elements - Nationaal Instituut voor Radio-elementen, en abrege: "I.R.E.". Ion detector. 4,082,952, Cl. 250-381.000.

DeRosa, Robert J.; and Campbell, Robert T., to United States of America, Army. Time alignment error sensor system for range tracking. 4,083,048, Cl. 343-7.300.

DeRyke, Thomas V.: *See—*
Patzke, Robert C.; DeRyke, Thomas V.; and Meller, Frederick D., 4,082,206, Cl. 222-400.700.

Desco Corporation: *See—*
Lenken, Thomas J., 4,081,999, Cl. 73-343.00R.

Deutsch, Ralph, to Nippon Gakki Seizo Kabushiki Kaisha. Sliding overtone generation in a computor organ. 4,082,028, Cl. 84-1.240.

DeVaughn, Donald H., to Bio-Syn, Inc. Means for conveying pathological specimens safely to places of identification. 4,082,614, Cl. 195-139.000.

Devault, Albert N.: *See—*
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Didier, Alain; and Letailleur, Jean-Luc, to Institut de Recherches de la Siderurgie Francaise (IRSID). Installation for the agglomeration of a particulate mineral charge and operation thereof. 4,082,541, Cl. 75-5.000.

Diedrich, Karl Heinz: *See—*
Misiano, Carlo; Diedrich, Karl Heinz; and Simonetti, Enrico, 4,082,637, Cl. 204-192.00E.

Diehr, Hans-Joachim; and Arold, Hermann, to Bayer Aktiengesellschaft. Preparation of dithiophosphoric acid ester dihalides. 4,082,822, Cl. 260-972.000.

Dieme, Hilmar K., to Amerace Corporation. Apparatus for producing locking patches on magnetic screws. 4,082,058, Cl. 118-319.000.

Dienst, Carl S.: *See—*
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Dietz, David C.: *See—*
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Dininio, Thomas, to Maul Technology Corporation. Valve block. 4,082,108, Cl. 137-269.500.

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Display Corporation International: *See—*
Sturm, Michael, 4,082,183, Cl. 206-301.000.

DiStefano, Thomas Herman, to International Business Machines Corporation. Luminescent material, luminescent thin film therefrom, and optical display device therewith. 4,082,889, Cl. 428-328.000.

Divona, Charles J., to United States of America, Energy. Fuel subassembly leak test chamber for a nuclear reactor. 4,082,607, Cl. 176-19.0LD.

Dobrosielski, Stephen S.; Richards, Edward L.; and Skalka, Paul, to Westinghouse Electric Corporation. Pushbutton electric switch. 4,083,027, Cl. 337-66.000.

Dr. Carl Hahn, GmbH: *See—*
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Documation, Inc.: *See—*
Snyder, Robert, 4,082,944, Cl. 235-309.000.

Doherty, George O. P., to Eli Lilly and Company. 1H-Imidazo(4,5-b)pyridine derivatives. 4,082,534, Cl. 71-92.000.

Dold, Anthony A. Casket canopy. 4,082,384, Cl. 312-3.000.

Donato, Anthony C.; and Russo, Neil, to Lightolier Incorporated. Light track device with connector module. 4,082,395, Cl. 339-21.00R.

Donnet, Jean-Baptiste: *See—*
Papirer, Eugene; and Donnet, Jean-Baptiste, 4,082,660, Cl. 210-36.000.

Dornfeld, Kenneth A.; Marlow, Jerry R.; and Sanders, Robert K., to General Motors Corporation. Hydrostatic transmission control. 4,082,013, Cl. 74-866.000.

Dorst, Richard: *See—*
Reime, Roy O.; and Stewart, Byron C., 4,082,988, Cl. 318-139.000.

Dow Chemical Company, The: *See—*
McKendry, Lennon H., 4,082,758, Cl. 260-294.80F.
McKendry, Lennon H., 4,082,759, Cl. 260-294.80E.
Shier, George D., 4,082,748, Cl. 544-98.000.
Wiley, A. C., Jr.; and Taylor, Otis C., 4,082,630, Cl. 205-98.000.

Dow Corning Corporation: *See—*
Farminer, Kenneth W., 4,082,690, Cl. 252-321.000.
Harper, Jack R., 4,082,702, Cl. 260-2.5AK.
Liles, Donald T.; and Michael, Keith W., 4,082,719, Cl. 260-37.0SB.
Speier, John L., 4,082,790, Cl. 260-448.80R.
Talcott, Thomas D., 4,082,509, Cl. 21-58.000.

Dowse, Brian Edward Wesley, to Golder Hoek and Associates Limited. Underwater structure. 4,081,970, Cl. 61-88.000.
Draugelis, Vaidevutis C.; and Schafer, Eugene D., to Xerox Corporation. System for superposition of color separation images. 4,082,443, Cl. 355-4.000.
Dravo Corporation: *See*—
Kent, Harry James; and Pietrusza, Arthur Jacob, 4,082,489, Cl. 425-222.000.
Dresser Europe S. A.: *See*—
Butcher, Alan George, 4,082,106, Cl. 137-174.000.
Dresser Industries, Inc.: *See*—
Craig, Paul George, 4,082,015, Cl. 76-108.00A.
Marquis, Gerald L., 4,082,144, Cl. 166-250.000.
Rothwell, Thomas F., 4,082,246, Cl. 251-307.000.
Driscoll, John J.; Svatek, Thomas A.; and Wareham, Richard R., to Polaroid Corporation. Slide viewer and photographic copier. 4,082,446, Cl. 355-27.000.
Drostholm, Frede Hilmar. Method and apparatus for making continuous lengths of resin tubes. 4,082,597, Cl. 156-429.000.
Dryczynski, Kurt: *See*—
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du Pont of Canada Limited: *See*—
Zboril, Vaclav George, 4,082,880, Cl. 428-220.000.
Dudkowski, Joseph John, to American Cyanamid Company. 2,6-Dinitroaniline herbicidal compositions. 4,082,537, Cl. 71-121.000.
Duff, Clifford C.; and Salloum, Robert J., to General Motors Corporation. Feeding apparatus for lightweight plastic particles into a high pressure reactor. 4,082,366, Cl. 302-11.000.
Duffy, Robert Donovan; and Stout, Eldon Charles, to Union Carbide Corporation. Polyurethane prepolymers, rebonded polyurethane foam and methods of forming the same. 4,082,703, Cl. 260-2.5BE.
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Dugge, Richard H.; and Van Dyke, Ronald D., to ACF Industries, Incorporated. Pneumatic outlet operating mechanism. 4,082,365, Cl. 302-52.000.
Dulger, Viktor. Dirt filter for water pipes. 4,082,676, Cl. 210-447.000.
Dunn, Barbara Lee: *See*—
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Du Pont de Nemours, E. I., and Company: *See*—
Bessett, Robert James; Cordes, Walter John; and Fuchs, Julius Jakob, 4,082,787, Cl. 260-453.00P.
Bellina, Russell Frank; and Fost, Dennis Lynn, 4,082,848, Cl. 424-273.000.
Coates, Don Mayo, 4,082,887, Cl. 428-289.000.
Eastlack, George Franklin, 4,082,742, Cl. 260-187.000.
Shook, Howard Everett, Jr., 4,082,811, Cl. 260-606.50B.
Durametallic Corporation: *See*—
Adams, William V., 4,082,297, Cl. 277-15.000.
Dwyer, Robert M., to Massey-Ferguson Inc. Articulated vehicle steering system. 4,081,961, Cl. 60-386.000.
Dyckman, Edward J.; Montemarano, Jean A.; and Fischer, Eugene C., to United States of America, Navy. Low leaching antifouling organometallic polyesters. 4,082,709, Cl. 260-22.0CB.
Dynamit Nobel Aktiengesellschaft: *See*—
Bendler, Hellmut; and Bretfeld, Anton, 4,081,964, Cl. 60-636.000.
Dzik, Boleslaw: *See*—
Szadkowska, Maria; Pisarek, Jerzy; Dzik, Boleslaw; Staniak, Elzbieta; Lipniewska, Danuta; and Bijok, Franciszek, 4,082,853, Cl. 426-36.000.
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Chen, James Ling; and Battaglia, Jean M., 4,082,881, Cl. 424-241.000.
Hauck, Frederic Peter, 4,082,773, Cl. 260-340.50R.
Eagle Engineering Company Limited, The: *See*—
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Eastlack, George Franklin, to Du Pont de Nemours, E. I., and Company. Process for preparing an aqueous disazo dye concentrate. 4,082,742, Cl. 260-187.000.
Eastman, George Y., to Thermacore, Inc. Production of liquid compatible metals. 4,082,575, Cl. 148-6.350.
Eastman Kodak Company: *See*—
Groet, Nicholas H., 4,082,553, Cl. 96-74.000.
Merkel, Paul Barrett, 4,082,555, Cl. 96-114.100.
Steklenski, David J.; and Albuerne, Evelio A. Perez, 4,082,551, Cl. 96-1.0PC.
Yoerger, William E., 4,082,550, Cl. 96-1.50R.
Eastside Machine & Welding, Inc.: *See*—
Appleman, Theodore C.; and Wacker, Wade L., 4,082,226, Cl. 239-584.000.
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German, Dale F., 4,082,056, Cl. 116-34.00R.
McDermott, Hugh L., 4,082,480, Cl. 417-283.000.
Ebauches SA: *See*—
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Chappatte, Jean-Maurice, 4,081,950, Cl. 58-4.00R.
Eber, David Henry, to Trane Company, The. Air cooled centrifugal refrigeration machine with provision to prevent evaporator freezing. 4,081,971, Cl. 62-216.000.
Echeverria, Federico S.: *See*—
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Eckel, Emery, to Eckel Manufacturing Co. Power operated drill pipe tongs. 4,082,017, Cl. 81-57.160.
Eckel Manufacturing Co.: *See*—
Eckel, Emery, 4,082,017, Cl. 81-57.160.
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Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; Petzold, Manfred; and Uphues, Gunter, 4,082,689, Cl. 252-321.000.
Ecodyne Corporation: *See*—
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Edeus, James A., to National Manufacturing, Co. Lower guide for horizontally sliding door. 4,081,880, Cl. 16-90.000.
Edo, Taro: *See*—
Mishuku, Minoru; Edo, Taro; and Tsuchiya, Nobujiro, 4,082,559, Cl. 106-43.000.
Edward Curran Engineering Limited: *See*—
Corbett, Roger Patrick; Gilson, Trevor Robert; Nealon, Terence Patrick; and Hendra, Patrick John, 4,082,860, Cl. 427-27.000.
Eerkens, Jozef Willem. High mass isotope separation process and arrangement. 4,082,633, Cl. 204-157.10R.
Egawa, Setsuya; Sakamoto, Masahiro; and Matsushita, Toshihiko, to NCR Corporation. Process for producing microcapsules. 4,082,688, Cl. 252-316.000.
Ehrhart, Philip J., to Sperry Rand Corporation. Header suspension and lift means. 4,081,946, Cl. 56-14.400.
Eibeck, Richard Elmer; and Booth, Robert Edwin, to Allied Chemical Corporation. Preparation of sulfur fluorides. 4,082,839, Cl. 423-489.000.
Eichenauer, Larry L. Carton for fruit and the like. 4,082,215, Cl. 229-36.000.
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Eigenmann, Ludwig. Method and devices for road surface marking. 4,082,587, Cl. 156-71.000.
Eiglmeier, Kurt, to Hoechst Aktiengesellschaft. Process for the manufacture of aromatic 1,3-diketones. 4,082,807, Cl. 260-590.00R.
Einchcombe, Kenneth C. G.; and Kornat, Kazimierz F., to Ford Motor Company. Sliding caliper-type disc brake and support structure therefore. 4,082,167, Cl. 188-73.600.
El-Do, Inc.: *See*—
Traylor, Fling Armstrong, Jr., 4,082,874, Cl. 428-54.000.
El Paso Products Company: *See*—
Mims, Samuel S., 4,082,788, Cl. 260-465.400.
Eldon Industries, Inc.: *See*—
Knowles, Alvis R.; and Foster, Harold S., 4,082,940, Cl. 219-239.000.
Eldridge, Albert M. Sundial. 4,081,911, Cl. 33-270.000.
Electro-Therm, Inc.: *See*—
Salinger, Fred G., 4,082,301, Cl. 277-212.00F.
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Pressman, Gerald L., 4,082,448, Cl. 355-3.0SC.
Eli Lilly and Company: *See*—
Brannon, Donald R.; and Neuss, Norbert, 4,082,754, Cl. 260-287.00P.
Chou, Ta-Sen; and Burgtorf, James R., 4,082,766, Cl. 260-326.0HL.
Clarke, John W., 4,082,216, Cl. 229-55.000.
Doherty, George O. P., 4,082,534, Cl. 71-92.000.
Hall, David A.; and Heiney, Richard E., 4,082,627, Cl. 204-59.00R.
Kirby, John A., 4,082,774, Cl. 260-340.500.
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,082,753, Cl. 260-285.500.
Paget, Charles J.; and Wikel, James H., 4,082,762, Cl. 260-308.00R.
Elias, Robert T.: *See*—
Butterworth, George A. M.; and Elias, Robert T., 4,082,886, Cl. 428-284.000.
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Elkington, W. Brice, to Occidental Oil Shale, Inc. Determining the locus of a processing zone in an in situ oil shale retort by sound monitoring. 4,082,145, Cl. 166-251.000.
Elkins, Nate, to Raymond Lee Organization, Inc., The. Electrical motor powered jump rope apparatus. 4,082,266, Cl. 272-75.000.
Ellis, Jeffrey R.; and Wagner, Herman B., to Tile Council of America. Sag resistant mortar compositions. 4,082,563, Cl. 106-90.000.
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Ellzey, James M., 4,082,273, Cl. 273-73.00J.
Ellzey, James M., to Ellzey Company, The. Striking implements. 4,082,273, Cl. 273-73.00J.
Embury, Lloyd Elliott. Method for fabricating tapered tubing. 4,082,211, Cl. 228-145.000.
Emhart Limited: *See*—
Jones, Stanley Peter; and Watson, William Ferguson, 4,082,527, Cl. 65-83.000.
Energy Conversion Devices, Inc.: *See*—
Izu, Masatsuga; and Ovshinsky, Stanford R., 4,082,861, Cl. 427-56.000.
Energy, Inc.: *See*—
Curet, Harvey Donald, 4,082,608, Cl. 176-61.000.
Energystics: *See*—
Schalow, Rudolph D., 4,083,047, Cl. 343-7.0VM.
Engler, Edward Martin; Kaufman, Frank Benjamin; and Scott, Bruce Albert, to International Business Machines Corporation. Process of optically printing highly conductive character utilizing a medium containing a halogenated hydrocarbon photoactivator and a tetrathiafulvalene or a related compound thereof. 4,082,552, Cl. 96-38.400.

Englund, Gosta Roland, to Svenska Dataregister AB. High speed printer having segmented drum. 4,082,035, Cl. 101-93.040.
Enokido, Tsuneo: *See—*
Sasaki, Minoru; Hida, Yukihiro; Enokido, Tsuneo; and Ito, Kaoru, 4,082,540, Cl. 75-3.000.
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Kelly, Earl M., 4,082,671, Cl. 210-195.00S.
Epsztein, Bernard: *See—*
Autran, Jean Michel; and Epsztein, Bernard, 4,083,021, Cl. 333-72.000.
Erdley, Harold F., to Teledyne Industries, Inc. Spin coupled, angular rate sensitive inertial sensors with mounting structure and method of fabricating and mounting same. 4,082,005, Cl. 73-505.000.
Erdmann, Bernhard: *See—*
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Erickson, John W.; and Petrie, Harold L., to Kobe, Inc. Articulated turbine pump. 4,082,482, Cl. 417-408.000.
Erickson, Lloyd A., to Illinois Tool Works, Inc. Plastic screw grommet. 4,082,030, Cl. 85-80.000.
Eriksson, Anders Gunnar: *See—*
Carlqvist, Bengt Roland; and Eriksson, Anders Gunnar, 4,082,924, Cl. 179-84.0VF.
Ernest Scragg & Sons Limited: *See—*
Parker, Walter, 4,081,948, Cl. 57-34.0HS.
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; Schurger, Rainer; Brandenstein, Manfred; and Burkl, Erich, to SKF Industrial Trading & Development Company B.V. Axially movable bearing device. 4,082,374, Cl. 308-6.00C.
Erwin, Ransome W., to Austral-Erwin Engineering Company. Heat exchange method. 4,082,140, Cl. 165-45.000.
Eschke, Bernd, to Blaupunkt-Werke GmbH. Method and circuit for generation of digitally frequency-shiftable electric signals. 4,083,008, Cl. 325-163.000.
Esemplare, Pascal E.; and Beeferman, Dennis, to Sutures Inc. Process for the production of rubber articles having improved slip coating. 4,082,862, Cl. 427-133.000.
Estes, Ronald L.; McGee, Larry S.; and Welton, Sanford M., to PPG Industries, Inc. Method of applying powder to a glass ribbon. 4,082,526, Cl. 65-24.000.
Ethyl Corporation: *See—*
Niebylski, Leonard M.; and Rifkin, Ellis B., 4,082,517, Cl. 44-68.000.
Evancho, Joseph W.; Shabel, Barrie S.; and Truckner, William G., to Aluminum Company of America. Aluminum structural members for vehicles. 4,082,578, Cl. 148-12.70A.
Evans, Delme; Jolley, Michael Ralph John; Ross, William James; and Swann, Brian Picton, to Lilly Industries Limited. Acylamino derivatives. 4,082,771, Cl. 260-332.20R.
Evans, John C., Jr., to United States of America, National Aeronautics and Space Administration. Solar cell collector. 4,082,569, Cl. 136-89.0CC.
Ex-Cell-O Corporation: *See—*
Crawford, Duncan J.; and Santiago, Gonzalo D., 4,082,497, Cl. 431-158.000.
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F. K. Suzuki International, Inc.: *See—*
Morita, Toyoshige; Fujita, Isamu; and Iwamura, Junichi, 4,082,858, Cl. 426-597.000.
Faarup, Peter: *See—*
Borrevang, Poul; Guddal, Erling; Petersen, Henning Borge; Faarup, Peter; and Nielsen, Jorgen Ilum, 4,082,745, Cl. 260-239.100.
Fabian, Gordon R.; McCollum, James H.; and Kammerer, Leo P., to Rockwell International Corporation. Aircraft control system providing hardover protection and full control authority. 4,082,238, Cl. 244-17.130.
Fabricant, Norman. Yo-yo toy carrying an additional member. 4,081,924, Cl. 46-61.000.
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Theys, Andre, 4,081,973, Cl. 66-64.000.
Fairnington, Robert: *See—*
Hodgson, Brian; Fairnington, Robert; Thorneycroft, Malcolm; and Grant, Ronald Malcolm, 4,082,031, Cl. 90-4.000.
Falconbridge Nickel Mines Limited: *See—*
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Falesiedi, Roberto: *See—*
Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, 4,081,895, Cl. 29-573.000.
Farmer Foundation Company, Inc.: *See—*
Aurora, Ravi P.; and Farmer, Glyen D., 4,081,992, Cl. 73-84.000.
Farmer, Glyen D.: *See—*
Aurora, Ravi P.; and Farmer, Glyen D., 4,081,992, Cl. 73-84.000.
Farminer, Kenneth W., to Dow Corning Corporation. Antifoam process for non-aqueous systems. 4,082,690, Cl. 252-321.000.
Farney, George K.; and Feulner, Fred A., to Varian Associates, Inc. Method and apparatus for reducing noise in crossed-field amplifiers. 4,082,979, Cl. 315-39.300.
Fattore, Vittorio; and Notari, Bruno, to Snamprogetti, S.p.A. Manufacture of acrylonitrile from propylene, ammonia and oxygen. 4,082,785, Cl. 260-465.300.
Fechner, Erhard A.: *See—*
Keller, Alex J.; Dellinger, Keith Sidney; Ray, James Lester, Jr.; Cherry, Thomas Adrian; and Fechner, Erhard A., 4,081,949, Cl. 57-53.000.
Feit, Peter Werner; Nielsen, Ole Bent Tvaermose; Bruun, Herta; and Bretting, Claus Aage Svensgaard, to Leo Pharmaceutical Products Ltd. Sulphonamides, compositions containing the same and methods for using the same in the treatment of hypertension or odemeas. 4,082,851, Cl. 424-300.000.
Feldstein, Nathan. Method of applying catalysts for electroless deposition and article. 4,082,899, Cl. 428-457.000.
Fenne, Ivor, to CAV Limited. Fuel injection pumping apparatus. 4,082,481, Cl. 417-403.000.
Ferdinandi, Eckhardt: *See—*
Bagli, Jehan F.; and Ferdinandi, Eckhardt, 4,082,772, Cl. 260-332.30H.
Fergg, Berthold: *See—*
Bickl, Horst; Treiber, Helmut; Findeis, Gunter; Knor, Bernhard; Payrhammer, Bernd; and Fergg, Berthold, 4,082,465, Cl. 356-203.000.
Ferlay, Jean: *See—*
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Ferre, Franco: *See—*
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Ferrell, Sherwood W.; Mann, Friedrich H.; and Schaefer, Henry A., to General Electric Company. Battery holder and connector for a radio receiver or the like. 4,083,011, Cl. 325-352.000.
Ferriss, Lincoln Stark: *See—*
Stiles, John Callender; and Ferriss, Lincoln Stark, 4,082,990, Cl. 318-662.000.
Fester, Amos M. Automatic doughnut making machine. 4,082,033, Cl. 99-406.000.
Feulner, Fred A.: *See—*
Farney, George K.; and Feulner, Fred A., 4,082,979, Cl. 315-39.300.
Fex, Hans Jacob; Kristensson, Sten Krister; and Stamvik, Anders Robert, to Aktiebolaget Leo. Acylation process for the preparation of steroid phenolic n-disubstituted carbamate esters, and ion pair solution for use in the process. 4,082,779, Cl. 260-397.500.
Fiat-Allis Construction Machinery, Inc.: *See—*
Hawk, Dale Wyatt, 4,082,310, Cl. 280-492.000.
Fiber Materials, Inc.: *See—*
Kendall, Ernest G.; and Pepper, Roger T., 4,082,864, Cl. 427-248.00B.
Fielding, Ivor R.; and Poppe, Wassily, to Standard Oil Company (Indiana). High impact polypropylene resins containing phthalide. 4,082,716, Cl. 260-30.40R.
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Finley, Richard Arthur: *See—*
Zeineh, Rashid Ayoub; and Finley, Richard Arthur, 4,082,668, Cl. 210-129.000.
Finnegan, Robert J., to Barreca Products Co., Subsidiary of Shelburne Industries, Inc. Releasable-strap ski-pole grip. 4,082,303, Cl. 280-11.37H.
Finney, James L., to Hughes Tool Company. Cam mounting for an impact tool. 4,082,151, Cl. 173-119.000.
Fireplace Corporation of America: *See—*
Lever, Paul H., 4,082,322, Cl. 285-133.00R.
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Dyckman, Edward J.; Montemarano, Jean A.; and Fischer, Eugene C., 4,082,709, Cl. 260-22.0CB.
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Rosinski, Edward J.; Stein, Thomas R.; and Fischer, Ronald H., 4,082,695, Cl. 252-465.000.
Fisher, Warren C.; Linder, Seymour M.; Pelley, Ralph L.; and Liao, Hsiang-Peng, to FMC Corporation. Glycidol process. 4,082,777, Cl. 260-348.250.
Fisk, William W.; and Wright, Howard J., to Cook Paint and Varnish Company. Caprolactone polymers from unsaturated monomers. 4,082,816, Cl. 260-855.000.
Flanders Filters, Inc.: *See—*
Allan, Thomas T., 4,082,525, Cl. 55-355.000.
Flatt, Richard P., to RTE Corporation. Nose shield for a gas actuated high voltage bushing. 4,082,404, Cl. 339-111.000.
Flavell, Evan R. Bilateral isokinetic exerciser. 4,082,267, Cl. 272-125.000.
Fleece, Robert I.: *See—*
Andon, Nicholaki A.; and Fleece, Robert I., 4,082,513, Cl. 23-288.00E.
Fletchic, Donald K.; Morrison, Howard J.; and Baer, Ralph H., to Marvin Glass & Associates. Tone arm lift mechanism. 4,082,292, Cl. 274-23.00R.
Flexicore Co., Inc., The: *See—*
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Flodins Industri AB: *See*—
Johannisson, Tor Gustav Alberto, deceased; and Johannisson, Tom, heir-at-law, 4,082,261, Cl. 271-69.000.
Florsheim, James M.: *See*—
Kulp, Jack H.; and Florsheim, James M., 4,083,033, Cl. 340-114.00R.
Flow Industries, Inc.: *See*—
Mercer, John E., 4,081,892, Cl. 29-421.00R.
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Watt, William Doyle, Jr.; and Flowerday, Dale L., 4,082,243, Cl. 248-205.00R.
Flynn, Peter Charles, to Petro-Canada Exploration Inc.; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. Coking of bituminous solids with hot solids recycle. 4,082,646, Cl. 208-11.00R.
FMC Corporation: *See*—
Fisher, Warren C.; Linder, Seymour M.; Pelley, Ralph L.; and Liao, Hsiang-Peng, 4,082,777, Cl. 260-348.250.
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Ford Motor Company: *See*—
Einchcombe, Kenneth C. G.; and Kornat, Kazimierz F., 4,082,167, Cl. 188-73.600.
Fortmann, William E., to United Technologies Corporation. Dual wedge fluid thrust bearing including wave spring. 4,082,375, Cl. 308-9.000.
Fost, Dennis Lynn: *See*—
Bellina, Russell Frank; and Fost, Dennis Lynn, 4,082,848, Cl. 424-273.000.
Foster, Beatrice D. Vacuum cabinet and gas venting shield. 4,082,092, Cl. 128-139.000.
Foster, Harold S.: *See*—
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Foster Wheeler Energy Corporation: *See*—
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Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See*—
Masumoto, Hakaru; Murakami, Yuetsu; and Nakamura, Naoji, 4,082,579, Cl. 148-31.550.
Fox, James E. Anti-sway apparatus for trailers. 4,082,309, Cl. 280-446.00B.
Francois, Maurice, to Trefilunion. Method of producing tubular lattice reinforcement for reinforced concrete tubular pipe having a socket at one end thereof. 4,082,120, Cl. 140-107.000.
Franetzki, Manfred; Korn, Volker; and Prestele, Karl, to Siemens Aktiengesellschaft. Apparatus for determination of respiratory passageway resistance. 4,082,088, Cl. 128-2.080.
Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostic generator. 4,082,954, Cl. 250-421.000.
Franklin Manufacturing Company: *See*—
Puterbaugh, Richard L., 4,082,825, Cl. 264-46.500.
Franson, David C.: *See*—
Hoffman, Robert K.; and Franson, David C., 4,082,107, Cl. 137-195.000.
Franz, Helmut, to PPG Industries, Inc. Seasonably adjustable window. 4,081,934, Cl. 52-171.000.
Fraser, Lawrence J., to Xerox Corporation. Multi-color development system. 4,082,061, Cl. 118-645.000.
Fredrikson, Bengt, to ASEA Aktiebolag. Electric induction heating of materials of low electrical conductivity. 4,082,544, Cl. 75-12.000.
Fridlender, Lev Moiseevich: *See*—
Shergov, Igor Vladimirovich; Slavinsky, Vladimir Danilovich; Fridlender, Lev Moiseevich; Zharinov, Valery Ivanovich; and Kozhaev, Arkady Filippovich, 4,082,938, Cl. 219-121.0EB.
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Burton, Lawrence; and Friedman, Frank, 4,082,732, Cl. 260-112.00B.
Burton, Lawrence; and Friedman, Frank, 4,082,733, Cl. 260-112.00B.
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Fries, William; and Napierski, Silvia, to Rohm and Haas Company. Sugar decolorizing quaternary ammonium acrylamide resins. 4,082,701, Cl. 260-2.10E.
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Johst, Wolfgang; Friese, Axel; and Simon, Stefan, 4,081,884, Cl. 28-119.000.
Friesen, Larry Dean; and Johannson, Richard James, to Towmotor Corporation. Lift truck mast stabilizer. 4,082,199, Cl. 214-672.000.
Fritz, Andre; and Dunn, Barbara Lee, to Ciba-Geigy Corporation. Ultraviolet light-curable diacrylate hydantoin adhesive compositions. 4,082,635, Cl. 204-159.230.
Fritz, Galen F.: *See*—
Taylor, James B., Jr.; and Fritz, Galen F., 4,081,898, Cl. 29-622.000.
Fritzsche, Alfred Keith; and Leonard, Richard L., to Monsanto Company. Hollow fiber membranes of ethylene copolymers and process for use. 4,082,658, Cl. 210-22.00R.
Frump, John Adams, to IMC Chemical Group, Inc. Temperature sensitive glass assembly having an aqueous interlayer of an oxazoline solution. 4,082,892, Cl. 428-332.000.
Fry, Stanley Eugene; and Hurd, Claude Calvert, to Bourns, Inc. Compensator valve. 4,082,093, Cl. 128-142.200.
Fuchs, Julius Jakob: *See*—
Bassett, Robert James; Cordes, Walter John; and Fuchs, Julius Jakob, 4,082,787, Cl. 260-453.00P.
Fuchs, Otto; and Troster, Helmut, to Hoechst Aktiengesellschaft. Benzothioxanthenes. 4,082,769, Cl. 260-328.000.
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Mishuku, Minoru; Edo, Taro; and Tsuchiya, Nobujiro, 4,082,559, Cl. 106-43.000.
Fuji Electric Co., Ltd.: *See*—
Aoki, Sethuo; and Sogo, Yoshiaki, 4,082,936, Cl. 219-10.410.
Fuji Photo Film Co., Ltd.: *See*—
Fukui, Takashi; and Enomoto, Hirobumi, 4,082,458, Cl. 356-73.000.
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Kameda, Nobuyuki; Hisada, Yoshio; Kato, Toshiro; and Fujinami, Akira, 4,082,849, Cl. 424-274.000.
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Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,082,420, Cl. 350-96.310.
Fukai, Masakazu: *See*—
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Funk, Erwin D., to Kamyr Inc. Method and apparatus for hydraulic transmission of coal, oil shale, mineral ores, etc. from the face to the surface of underground mines. 4,082,368, Cl. 302-14.000.
Furuya, Kiyoto, to Daiichi Denshi Kogyo Kabushiki Kaisha. Method for electrolytic treatment. 4,082,618, Cl. 204-15.000.
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Ikeda, Masao; Miyamoto, Shigeo; Nozawa, Thutomu; Kurobe, Akira; and Futsukaichi, Osamu, 4,082,744, Cl. 260-239.0BB.
GAF Corporation: *See*—
Bennett, Frank P., 4,082,440, Cl. 353-26.00R.
Gage, Ernest L. Separator apparatus. 4,082,657, Cl. 209-311.000.
Gal, Andrew E., to United States of America, Health, Education and Welfare. Synthesis of 2-alkanoylamino-4-nitrophenyl phosphorylcholine-hydroxide. 4,082,781, Cl. 260-403.000.
Galesloot, Wilhelmus Gerardus, to Lever Brothers Company. Cleaning of hard surfaces. 4,082,683, Cl. 252-105.000.
Gambarov, Vitaly Stepanovich: *See*—
Minin, Vladilen Fedorovich; Gambarov, Vitaly Stepanovich; Kachan, Mikhail Samuilovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; and Trishin, Jury Alexeevich, 4,081,982, Cl. 72-56.000.
Gamble, Dennis H., to Westinghouse Electric Corporation. Bus duct assembly. 4,082,393, Cl. 339-14.00R.
Gamboa, Paul, to Zenith Radio Corporation. High voltage shutdown circuit for a television receiver. 4,082,986, Cl. 315-411.000.
Gansert, Willi, to Robert Bosch GmbH. Multi-pole plug-and-socket connecting arrangement. 4,082,400, Cl. 339-91.00R.
Ganter, Wolfgang: *See*—
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Gantier, Pierre. Device for rotational transmission of mechanical power depending on an angular speed selector which functions as a result of the resistance which it meets. 4,082,010, Cl. 74-800.000.
Garbalizer Corporation of America: *See*—
Brewer, John C., 4,082,232, Cl. 241-236.000.
Garcia, Francisco G. Orthodontic pliers. 4,081,909, Cl. 32-66.000.
Garcia, Luis: *See*—
Leasure, William C.; and Garcia, Luis, 4,081,943, Cl. 53-26.000.
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Bainard, Dean R., 4,082,295, Cl. 277-1.000.
Garnier, Marcel A.; and Moreau, Rene J., to Agence Nationale de Valorisation de la Recherche (ANVAR). Electromagnetic apparatus for construction of liquid metals. 4,082,207, Cl. 222-594.000.
Garrett Corporation, The: *See*—
Schelp, Helmut R., 4,081,958, Cl. 60-39.51R.
Garver, John P. Tennis racket string positioning device. 4,082,272, Cl. 273-73.00A.
Gatsis, John G.; and Tan, Gim, to UOP Inc. Process for the liquefaction of coal and separation of solids from the product stream. 4,082,643, Cl. 208-8.000.
Gatsis, John G.; and Tan, Gim, to UOP Inc. Process for the liquefaction of coal and separation of solids from the product stream. 4,082,644, Cl. 208-8.000.
Gazy, Michael A.: *See*—
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Gebauer, Bodo G., to GTE Automatic Electric Laboratories Incorporated. Electrodeposition of ruthenium. 4,082,622, Cl. 204-40.000.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
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Gehring, Karl: *See*—
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Gelder, David: *See*—
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General Dynamics Corporation: *See*—
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General Electric Company: *See*—
Andersen, Edward O., 4,081,897, Cl. 29-622.000.
Anthony, Thomas R.; and Cline, Harvey E., 4,082,572, Cl. 148-1.500.
Arendt, Ronald H.; Borom, Marcus P.; Huseby, Irvin C.; and Klug, Frederic J., 4,082,566, Cl. 134-2.000.
Baker, Jack M.; Clark, Gordon W.; Harper, Douglas M.; and Tomlinson, Leroy O., 4,081,956, Cl. 60-39.18B.
Barton, Sterling C.; Carson, Chester C.; and Echeverria, Federico S., 4,082,948, Cl. 250-304.000.
Bigelow, John E., 4,082,949, Cl. 250-329.000.
Curry, Herbert Leard; and Hall, Walter Lawrence, 4,082,891, Cl. 428-412.000.
Ferrell, Sherwood W.; Mann, Friedrich H.; and Schaefer, Henry A., 4,083,011, Cl. 325-352.000.
Gibb, George H.; and Rabeau, Henry A., 4,082,115, Cl. 137-630.200.
Gries, Donald A., 4,082,378, Cl. 308-15.000.
Grossman, Leonard N.; and Packard, Douglas R., 4,082,834, Cl. 423-210.000.
Hay, Allan S., 4,082,808, Cl. 260-609.00F.
Laskaris, Evangelos T., 4,082,967, Cl. 310-64.000.
Lennon, David C., 4,082,412, Cl. 339-256.0SP.
Losert, Gerhard K., 4,081,997, Cl. 73-168.000.
Nakata, Roy; and Bohlinger, Arthur Leo, 4,082,933, Cl. 200-163.000.
Rhude, John M., 4,082,995, Cl. 324-51.000.
Strong, Herbert M., 4,082,185, Cl. 206-525.000.
Thornton, Roy F.; and Weininger, Joseph L., 4,081,899, Cl. 29-623.200.
Yang, Kei-Hsiung; and De Luca, John A., 4,083,018, Cl. 331-94.50F.
Yu, Rosendo U., 4,083,063, Cl. 357-38.000.

General Mills, Inc.: *See*—
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Balogh, Richard L., 4,082,073, Cl. 123-140.00R.
Baugh, Edward D., 4,082,074, Cl. 123-140.0FG.
Bluhm, Elmer; and Vaas, Frederick T., Jr., 4,081,890, Cl. 29-157.00C.
Carol, John A., Jr.; Paxton, Wayne E.; and Riddel, John W., 4,082,158, Cl. 180-108.000.
Cerano, Leon R.; and Reichardt, Mayo M., 4,082,486, Cl. 425-129.00R.
Davis, Leonard C., 4,082,139, Cl. 165-8.000.
Dornfeld, Kenneth A.; Marlow, Jerry R.; and Sanders, Robert K., 4,082,013, Cl. 74-866.000.
Duff, Clifford C.; and Salloum, Robert J., 4,082,366, Cl. 302-11.000.
Haka, Raymond J., 4,081,960, Cl. 60-289.000.
Lentz, Carl A., 4,082,009, Cl. 74-731.000.
Marks, Stephen W.; and Marsh, Robert E., 4,082,926, Cl. 200-19.0DR.
McQuinn, Ted M.; and Anderson, Richard B., 4,082,011, Cl. 74-862.000.
Peeples, Denny L., 4,082,930, Cl. 200-84.00C.
Schaefer, Robert H.; and McQuinn, Ted M., 4,082,012, Cl. 74-864.000.
Schultz, Frederick K., 4,083,013, Cl. 328-207.000.
Wortham, Otis W.; and Sundstrom, John A., 4,081,975, Cl. 68-18.0FA.

Genrikh, Georgy Andreevich: *See*—
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Genuit, Luther L. Light switch with delayed turnoff. 4,082,961, Cl. 307-141.000.

George, David B., to Kennecott Copper Corporation. Copper precipitate agglomerization process. 4,082,542, Cl. 75-5.000.

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German, Dale F., to Eaton Corporation. Pressure change indicator. 4,082,056, Cl. 116-34.00R.

Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, to Snamprogetti, S.p.A. Method for constructing a thermoelectric module and the module so obtained. 4,081,895, Cl. 29-573.000.

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Krob, Erwin; Weigl, Erwin; and Svoboda, Josef, 4,082,315, Cl. 280-631.000.

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Berndt, Uwe; Erdmann, Bernhard; and Keller, Cornelius, 4,082,547, Cl. 75-122.700.

Getz, Marvin G.: *See*—
Krolak, Ronald L.; Cackley, George W.; Getz, Marvin G.; and Ritter, Arthur J., Jr., 4,082,156, Cl. 180-9.620.

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Hinrichsen, Gerhard, 4,082,248, Cl. 254-29.00R.

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Ghosh, Subrata, to Chrysler Corporation. Nickel-base superalloy. 4,082,581, Cl. 148-32.000.

Gibb, George H.; and Rabeau, Henry A., to General Electric Company. Valve operator. 4,082,115, Cl. 137-630.200.

Gibbemeyer, Joseph Franz, to Cincinnati Milacron Inc. Conveyor combined with coupling. 4,082,175, Cl. 198-377.000.

Gibson, David L.; Barrett, Lawrence J.; Moore, Patricia A.; and Butler, David R., to C. H. Stuart Inc. Convertible tray cabinet. 4,082,390, Cl. 312-284.000.

Gies, Johannes, to Siemens Aktiengesellschaft. Diode switch. 4,082,964, Cl. 307-259.000.

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Gilbert, Stephen Lee: *See*—
Ban, Vladimir Sinisa; and Gilbert, Stephen Lee, 4,082,865, Cl. 427-253.000.

Gilchrist, William K.: *See*—
Bergee, Mark A.; and Gilchrist, William K., 4,081,865, Cl. 2-425.000.

Gilmore, John F.: *See*—
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Gilson, Trevor Robert: *See*—
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Girardin, Jean-Claude, to Portescap. Direct-current motor-generator. 4,082,970, Cl. 310-113.000.

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Golder Hoek and Associates Limited: *See*—
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Goldie, Brian Peter Forsyth, to British Petroleum Company Limited, The. Polymerization catalyst. 4,082,692, Cl. 252-429.00B.

Golin, Jeffrey R. Gas discharge lamp preparation process. 4,082,392, Cl. 316-19.000.

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Goodbary, Edgar R., 4,082,363, Cl. 301-6.0CS.

Gore, Bobby Joe. Vehicle air deflector. 4,082,341, Cl. 296-1.00S.

Gorell, Frederick R.: *See*—
Bertacchi, Ralph; and Gorell, Frederick R., 4,081,938, Cl. 52-410.000.

Gorog, Sandor: *See*—
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,082,813, Cl. 260-618.00B.

Goto, Giichi: *See*—
Miki, Takuichi; Hiraga, Kentaro; and Goto, Giichi, 4,082,780, Cl. 260-397.500.

Gottschalk, Robert E. Motion picture camera. 4,082,436, Cl. 352-72.000.

Gottschlich, James A., to NCR Corporation. Apparatus for equalizing tension in a ribbon cassette. 4,082,210, Cl. 226-91.000.

Gould, Inc.: *See*—
Angelis, John G., 4,082,408, Cl. 339-198.00G.
Gould, Orval E. Apparatus for grinding refuse. 4,082,231, Cl. 241-187.000.
Graff, Hart F.: *See*—
Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., 4,082,868, Cl. 427-329.000.
Grant, Ronald Malcolm: *See*—
Hodgson, Brian; Fairnington, Robert; Thorneycroft, Malcolm; and Grant, Ronald Malcolm, 4,082,031, Cl. 90-4.000.
Grassme, Ulrich: *See*—
Krause, Hartmut; and Grassme, Ulrich, 4,082,953, Cl. 250-413.000.
Graul, Juergen; and Murrmann, Helmuth, to Siemens Aktiengesellschaft. Process for suppressing parasitic components utilizing ion implantation prior to epitaxial deposition. 4,082,571, Cl. 148-1.500.
Graves, Charles A.: *See*—
Chang, Roland Wan-chan; and Graves, Charles A., 4,082,918, Cl. 179-1.0AA.
Greco, John J. Door securing device. 4,082,337, Cl. 292-338.000.
Green, Glen R.: *See*—
Hodges, Joseph L.; and Green, Glen R., 4,082,024, Cl. 83-402.000.
Grenawalt, John J.: *See*—
Lake, Peter B.; Grenawalt, John J.; and Pastorek, Ronald L., 4,082,576, Cl. 148-12.00F.
Grier, William R.: *See*—
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,082,172, Cl. 197-20.000.
Gries, Donald A., to General Electric Company. Deformable bearing seat. 4,082,378, Cl. 308-15.000.
Griffith, Glen R.; Sandusky, Zane A.; and Watson, George A., to Rockwell International Corporation. Apparatus and method for extrapolating the angular position of a rotating body. 4,081,995, Cl. 73-116.000.
Grimm-Lenz, Rainer: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer, 4,082,722, Cl. 260-42.430.
Grimmell, William Charles; Kaetzel, Gilbert Carl; Moran, John Milton; and Zanko, George Michael, to Hoffmann-La Roche Inc. Apparatus for color recognition and defect detection of objects such as capsules. 4,082,188, Cl. 209-73.000.
Grindley, C. Ronald; and Boyd, Larry G. Apparatus for removing dusting powder in offset presses. 4,082,037, Cl. 101-425.000.
Grobey, Paul A. Power cultivator with reciprocating blades. 4,082,149, Cl. 172-40.000.
Groet, Nicholas H., to Eastman Kodak Company. Interimage effects with spontaneously developable silver halide. 4,082,553, Cl. 96-74.000.
Groff, Leroy K. Counterbalancing supporting device. 4,082,244, Cl. 248-280.000.
Groninger, Markus, to Howag AG. Electric hygrometer. 4,083,030, Cl. 338-35.000.
Gross, Frank C., to A. B. Dick/Scott. Electrophotographic method for production of plural images on a sheet. 4,082,442, Cl. 355-3.00R.
Grossman, Leonard N.; and Packard, Douglas R., to General Electric Company. Process for gettering moisture and reactive gases. 4,082,834, Cl. 423-210.000.
Grundstrom, Erik Hilding; Grundstrom, Gote Einar; and Waleij, Ivar. Planting dibble. 4,082,048, Cl. 111-2.000.
Grundstrom, Gote Einar: *See*—
Grundstrom, Erik Hilding; Grundstrom, Gote Einar; and Waleij, Ivar, 4,082,048, Cl. 111-2.000.
GTE Automatic Electric Laboratories Incorporated: *See*—
Gebauer, Bodo G., 4,082,622, Cl. 204-40.000.
Meuller, Von W.; and Foerster, Ronald A., 4,083,025, Cl. 335-153.000.
GTE Laboratories Incorporated: *See*—
Birman, Joseph L.; and Mayburg, Sumner, 4,083,017, Cl. 331-94.50H.
GTE Sylvania Incorporated: *See*—
Palumbo, Dominic T., deceased; and Shaffer, Francis N., 4,082,687, Cl. 252-301.40F.
Shaffer, John W., 4,082,494, Cl. 431-95.00R.
Gubelmann, Walter S., executor: *See*—
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,082,172, Cl. 197-20.000.
Gubelmann, William S., deceased; by Gubelmann, Walter S., executor; and Grier, William R., to Realty & Industrial Corporation. Justifying text writing reproducing machine. 4,082,172, Cl. 197-20.000.
Guddal, Erling: *See*—
Borrevang, Poul; Guddal, Erling; Petersen, Henning Borge; Faarup, Peter; and Nielsen, Jorgen Ilum, 4,082,745, Cl. 260-239.100.
Guest, Ashley W., to British Aircraft Corporation Limited. Frequency lock loop. 4,083,014, Cl. 331-1.00A.
Guest, Paul Richard; and Ninneman, Lawrence D., to Owens-Illinois, Inc. Plastic container with support base, and method of assembly. 4,082,200, Cl. 215-1.00C.
Guiley, Clifford Dale, Jr.: *See*—
Backderf, Richard Harold; and Guiley, Clifford Dale, Jr., 4,082,895, Cl. 428-412.000.
Gulf Oil Canada Limited: *See*—
Flynn, Peter Charles, 4,082,646, Cl. 208-11.00R.
Gulf Research & Development Co.: *See*—
Kirkpatrick, Joel L., 4,082,765, Cl. 260-308.00C.
Gullotti, Damian V.: *See*—
Anthony, William H.; Brock, Andrew J.; and Gullotti, Damian V., 4,082,574, Cl. 148-2.000.
Gunnergaard, Marius: *See*—
Petersen, Carl Herbert; and Gunnergaard, Marius, 4,082,135, Cl. 164-404.000.
Gunther, William H., Jr.: *See*—
McPherson, John B.; and Gunther, William H., Jr., 4,082,603, Cl. 156-654.000.
Gustafson, Inc.: *See*—
Weber, Joseph A.; and Wenshau, Hugo, 4,082,004, Cl. 73-422.00R.
Gustafsson, Sven-Goran; Nilsson, Jan; and Syvakari, Pertti, to ASEA Aktiebolag. Protective coating for removable liner of press for hydrostatic extrusion. 4,081,984, Cl. 72-60.000.
Gwyn, John E., to Shell Oil Company. Mining oil shale and backfilling with mechanically compressed spent shale. 4,081,968, Cl. 61-35.000.
H. B. Fuller Company: *See*—
Mehta, Ramesh, 4,082,708, Cl. 260-18.00N.
Haack, William M., to Keene Corporation. Apparatus for forming an electroplated abrasive tool. 4,082,640, Cl. 204-279.000.
Haas, Werner E. L.; Adams, James E.; and Mechlowitz, Bela, to Xerox Corporation. Agglomeration imaging process. 4,082,549, Cl. 96-1.00R.
Hadden-Wight, Roger; and Johnson, Colin Stanley, to Irvin Bros. (Fleet Works) Limited. Printing on the sides of paper pads. 4,082,593, Cl. 156-230.000.
Haemmig, Adrian B., to Products of Information Technology, Inc. Vehicle location system. 4,083,003, Cl. 325-6.000.
Hafke, Carl: *See*—
Baron, Gerhard; Bierbach, Herbert; Hafke, Carl; and Pockrandt, Gunter, 4,082,520, Cl. 48-202.000.
Hagio, Shohachiro: *See*—
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Haines, Richard K. Privacy latch for folding and sliding doors. 4,082,329, Cl. 292-202.000.
Haka, Raymond J., to General Motors Corporation. Air flow control valve. 4,081,960, Cl. 60-289.000.
Hale, David Jerry, to Brunswick Corporation. V-engine cooling system particularly for outboard motors and the like. 4,082,068, Cl. 123-41.020.
Hall, David A.; and Heiney, Richard E., to Eli Lilly and Company. Electrolytic reduction of dihydrobenzopyranoxanthenones. 4,082,627, Cl. 204-59.00R.
Hall, Larry Baker, to Lockheed Corporation. Curling punch. 4,081,987, Cl. 72-389.000.
Hall, Roger D., to Bendix Corporation, The. Dual band monopole omni antenna. 4,083,050, Cl. 343-729.000.
Hall, Walter Lawrence: *See*—
Curry, Herbert Leard; and Hall, Walter Lawrence, 4,082,891, Cl. 428-412.000.
Halm Instrument Co., Inc.: *See*—
Konars, Clement R.; and Quinci, Emanuel, 4,082,262, Cl. 271-149.000.
Halopoff, William. Sectional garage door spring container. 4,082,133, Cl. 160-191.000.
Hamada, Takeshi; Ishigaki, Yoshio; and Hongu, Masayuki, to Sony Corporation. Current controlled emitter coupled multivibrator. 4,083,019, Cl. 331-113.00R.
Hamma Hamaphot KG., Hanke & Thomas: *See*—
Hanke, Rudolph, 4,082,600, Cl. 156-505.000.
Hamma, Noritaka: *See*—
Suzuki, Yoshio; Minai, Masayoshi; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, 4,082,913, Cl. 560-102.000.
Hamman, Willdoune. Trailer hitch assembly. 4,082,311, Cl. 280-507.000.
Hammer, Gregory. Nonlocking nestable container. 4,082,184, Cl. 206-519.000.
Hammond, H. Jack. Shut height gauge and method of using same. 4,081,910, Cl. 33-181.00R.
Hammonds, James C.; and Holt, Jan D., to ACF Industries, Incorporated. Fabricated railway car truck. 4,082,043, Cl. 105-182.00R.
Hancor, Inc.: *See*—
Sting, Donald W.; and Ott, Denis P., 4,082,327, Cl. 285-401.000.
Hanke, Rudolph, to Hamma Hamaphot KG., Hanke & Thomas. Film splicing apparatus. 4,082,600, Cl. 156-505.000.
Hantke, Gerhard John; and Ring, Harry Kenneth, Jr., to Trane Company, The. Valve assembly for use in an air distribution system. 4,082,114, Cl. 137-625.370.
Harbeck, Alfred; Rebhan, Dieter; and Walburg, Richard, to Hoechst Aktiengesellschaft. Packing for stuffing boxes of piston pumps with metal plunger. 4,082,300, Cl. 277-123.000.
Harmon, Robert W.: *See*—
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Harper, Douglas M.: *See*—
Baker, Jack M.; Clark, Gordon W.; Harper, Douglas M.; and Tomlinson, Leroy O., 4,081,956, Cl. 60-39.18B.
Harper, Jack R., to Dow Corning Corporation. Flame retardant rigid polyurethane syntactic foam. 4,082,702, Cl. 260-2.5AK.
Harrigan, Roy Major. Mechanical cardiac resuscitator. 4,082,090, Cl. 128-51.000.
Harrington, Timothy M.: *See*—
Marshall, J. Howard, III; and Harrington, Timothy M., 4,083,044, Cl. 340-347.0AD.
Harris Corporation: *See*—
Anderson, Robert John, 4,082,259, Cl. 270-73.000.
Harris, Frank W.; and Reinhardt, Bruce A., to Wright State University. Preparation of tetraketones. 4,082,806, Cl. 260-590.00D.

Harrison, Anthony William, to Girling Limited. Brake assembly including mounting, actuating and adjusting structure. 4,082,165, Cl. 188-59.000.
Harrison, Earnest R.: *See—*
Mattern, John; and Harrison, Earnest R., 4,083,049, Cl. 343-7.700.
Harvest Industries, Inc.: *See—*
Zollar, Leland H.; and Moore, Edward W., 4,082,677, Cl. 252-8.50B.
Harvey, Lawrence, to British Petroleum Company Limited, The. Solar energy collector. 4,082,082, Cl. 126-271.000.
Harvey, Ronald B.: *See—*
Jensen, Gerald A.; Harvey, Ronald B.; Caulfield, Patrick J.; Putzke, Dwayne H.; and Strunc, Gerald R., 4,082,943, Cl. 235-303.100.
Hase, Chiaki, to Daito Seimo Coshi Kaisha. Method of making a multi-level flower supporting net assembly. 4,082,831, Cl. 264-249.000.
Hasegawa, Katsumi; Nakanishi, Toru; and Oka, Toshihiko, to Toray Industries, Inc. Apparatus for producing compact yarn package. 4,081,888, Cl. 28-285.000.
Hashizume, Akihide: *See—*
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Hatano, Keizo: *See—*
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Hatton, William L.: *See—*
Bickford, William J.; Hatton, William L.; Pallemaerts, Colin J.; Tanzi, Paul J.; and Tsao, Carson K. H., 4,083,009, Cl. 325-304.000.
Haubein, Harold D.; Allen, George D.; Harmon, Robert W.; Ramsey, Edgar J., Jr.; and Pehle, Ronald C., to A.B. Chance Company. Pad-mounted double-fused vacuum switchgear. 4,083,028, Cl. 337-144.000.
Hauck, Frederic Peter, to E. R. Squibb & Sons, Inc. Tricyclic tetrahydro naphthaleneols and related compounds. 4,082,773, Cl. 260-340.50R.
Haug, Theobald: *See—*
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Haury, Gilbert E., to Invacare Corporation. Adjustable wheel chair. 4,082,348, Cl. 297-45.000.
Hawk, Dale Wyatt, to Fiat-Allis Construction Machinery, Inc. Low profile vehicle hitch. 4,082,310, Cl. 280-492.000.
Hay, Allan S., to General Electric Company. Thiobis-2,6-disubstituted phenol. 4,082,808, Cl. 260-609.00F.
Hayashi, Tadaaki; and Nakahara, Teruto, to Kabushiki Kaisha Ka-Pu. Wide-angle optical system for door viewer. 4,082,434, Cl. 350-225.000.
Hayes, John C.: *See—*
Pollitzer, Ernest L.; and Hayes, John C., 4,082,649, Cl. 208-111.000.
Hayes, Matthew N., to Westinghouse Electric Corporation. Arc chute. 4,082,931, Cl. 200-144.00C.
Hayes, Tom F., to Tenneco Chemicals, Inc. Apparatus for spraying interior surface of vessels. 4,082,057, Cl. 118-9.000.
Haynes, Kenneth H. Constant volume aerated showerhead apparatus. 4,082,225, Cl. 239-428.500.
Haythornthwaite, Peter F.; and Relf, Victor K., to Sodaflo Drinks Limited. Carbonating apparatus. 4,082,123, Cl. 141-64.000.
Haywood, George Lewis; and Haywood, Wesley Joseph, to George L. Haywood Co., The. Solar Collector and drive circuitry control means. 4,082,947, Cl. 250-203.00R.
Haywood, Wesley Joseph: *See—*
Haywood, George Lewis; and Haywood, Wesley Joseph, 4,082,947, Cl. 250-203.00R.
Hazelett, Robert William; and Wood, John Frederick Barry, to Hazelett Strip-Casting Corporation. Coolant nozzle apparatus in twin-belt continuous casting machines. 4,082,101, Cl. 134-127.000.
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Headrick, J. Charles; Starnes, R. Emory; and Peel, Robert C., to Southwire Company. Galvanized tube welded seam repair metallizing process. 4,082,212, Cl. 228-147.000.
Hearon, William Montgomery; Witte, John F.; and Lo, Cheng Fan, to Boise Cascade Corporation. Process for the production of dialdehyde cellulose from cellulose. 4,082,743, Cl. 536-30.000.
Heathman, John H.; and Lingley, Richard C., to General Dynamics Corporation. Continuous integrated clamping hoop space vehicle support system. 4,082,240, Cl. 244-158.000.
Hechenbleikner, Ingenuin, to Borg-Warner Corporation. Glass lamination utilizing cyclic phosphonates. 4,082,897, Cl. 428-426.000.
Heckmann, Wolfgang, to Klockner-Humboldt-Deutz Aktiengesellschaft. Vibrating centrifuge. 4,082,675, Cl. 210-360.00R.
Hedvall, Per; and Strandberg, Per, to ASEA Aktiebolag. Filter disc for magnetic separator. 4,082,656, Cl. 209-222.000.
Heemaf B.V.: *See—*
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Heine, Helmut A.; Schmidt, Otto H.; and Rosenbusch, Helmut W., to Propper Manufacturing Co., Inc. Apparatus for controlling the illumination of optical examination devices. 4,082,946, Cl. 362-32.000.
Heiney, Richard E.: *See—*
Hall, David A.; and Heiney, Richard E., 4,082,627, Cl. 204-59.00R.
Heinze, Christoph; Ruchlak, Kasimir; and Steude, Holm, to Hoechst Aktiengesellschaft. Process for concentrating latices. 4,082,659, Cl. 210-23.00F.
Heiss, Florian. Composition for sanitizing of surfaces. 4,082,852, Cl. 424-317.000.
Heller, Adam; Miller, Barry; and Vadimsky, Richard George, to Bell Telephone Laboratories, Incorporated. Articles electrodeposited with ruthenium and processes of producing such articles. 4,082,624, Cl. 204-47.000.
Heller, Adam: *See—*
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Heller, Wilhelm, to Fried. Krupp Huttenwerke AG. Process for the heat treatment of steel. 4,082,577, Cl. 148-12.100.
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Hendrix, William Louis, to Hendrix Wire & Cable Corporation. Spacer for aerial cables. 4,082,917, Cl. 174-146.000.
Hendrix Wire & Cable Corporation: *See—*
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Henkel Kommanditgesellschaft auf Aktien: *See—*
Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; Petzold, Manfred; and Uphues, Gunter, 4,082,689, Cl. 252-321.000.
Henley, Thomas D.; and Reeves, Richard F., to Amchem Products, Inc. Oil emulsion removal and recovery of oil. 4,082,867, Cl. 427-327.000.
Henman, Terence John; and Williams, Graham, to Imperial Chemical Industries Limited. Process for forming polymeric compositions. 4,082,720, Cl. 260-42.150.
Hens, Jozef Fr.: *See—*
van Wijngaarden, Ineke; Soudijn, Willem; Vandenberk, Jan; and Hens, Jozef Fr., 4,082,755, Cl. 260-293.600.
Hentschel, Robert Carl, Jr.; and Gignilliat, William McIntosh, to Allied Chemical Corporation. Pellet sampler and method of sampling pellets. 4,082,003, Cl. 73-422.00R.
Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity: *See—*
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Hercules Incorporated: *See—*
Rave, Terence W., 4,082,730, Cl. 260-72.00R.
Hermanson, Gerald Peter; Rickel, David Murray; and Carr, Robert Joseph, to Dayron Corporation. Method for attaching a workpiece to a continuous length of line. 4,081,894, Cl. 29-433.000.
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Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, 4,082,770, Cl. 260-330.500.
Hersberger, Pierre, to Ebauches SA. Electronic timepiece. 4,081,951, Cl. 58-23.00R.
Hertel, Hasso, to Hoechst Aktiengesellschaft. Process for the production of water-insoluble azo dyestuffs on the fiber. 4,082,503, Cl. 8-44.000.
Hertsius, Lars-Olov; and Arneborn, Anders, to Telefonaktiebolaget L M Ericsson. Cable cutter. 4,082,023, Cl. 83-293.000.
Hester, Jackson B., Jr., to Upjohn Company, The. Triazolo[4,3-a][1,4]benzodiazepinium quaternary salts. 4,082,761, Cl. 260-308.00R.
Heuer, Hans Herbert. Sunshade—foldable and hand-transportable. 4,082,102, Cl. 135-5.00R.
Heves Megyer Tanacsi Epitoipare Vallalat: *See—*
Kocsanyi, Laszlo; and Varga, Lajos, 4,082,367, Cl. 302-14.000.
Hewertson, Warren, to Imperial Chemical Industries Limited. Production of aromatic polyesters of improved color. 4,082,724, Cl. 260-45.75B.
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Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; Petzold, Manfred; and Uphues, Gunter, to Henkel Kommanditgesellschaft auf Aktien. Anti-foam compositions and process with bis-α-hydroxyamine derivatives. 4,082,689, Cl. 252-321.000.
Hicks, James Ray, to Recognition Equipment Incorporated. Plural tracker character detection and boundary location system. 4,083,034, Cl. 340-146.30H.
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Sasaki, Minoru; Hida, Yukihiro; Enokido, Tsuneo; and Ito, Kaoru, 4,082,540, Cl. 75-3.000.
Hightower, Tafari. Electric security lock. 4,081,980, Cl. 70-92.000.
Hill, Robert L. Protective basketball hoop. 4,082,269, Cl. 273-1.50R.
Hille, Ernst: *See—*
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Hillside Metal Products, Inc.: *See—*
Aromando, Nick A., 4,082,382, Cl. 308-190.000.
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Hinn, Werner, to RCA Corporation. Video amplifier including an A-C coupled voltage follower output stage. 4,082,996, Cl. 358-242.000.
Hinrichsen, Gerhard, to Gewerkschaft Eisenhutte Westfalia. Pipe driving apparatus. 4,082,248, Cl. 254-29.00R.
Hiraga, Kentaro: *See—*
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Hirata, Shinji, to West Electric Company, Ltd. Automatic electronic flash device. 4,082,982, Cl. 315-151.000.
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Yamada, Muneki; Hirata, Sadao; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,082,854, Cl. 426-106.000.
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Hiszpanski, Jan A., to Imperial-Eastman Corporation. Universal hydraulic impact tool. 4,082,471, Cl. 404-133.000.
Hitachi, Ltd.: *See—*
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Kanazawa, Tomohisa, 4,082,406, Cl. 339-112.00L.
Kohno, Hideki; Hashizume, Akihide; and Yamamoto, Shinji, 4,082,457, Cl. 356-39.000.
Ohuchi, Hirobumi; Kawakami, Sumio; and Okamura, Masahiro, 4,083,062, Cl. 357-13.000.
Okuhara, Shinzi, 4,082,923, Cl. 179-18.0GF.
Ouchi, Yoshio; and Ikeda, Takatoshi, 4,083,053, Cl. 346-75.000.
Yamamoto, Hiroe; Takahashi, Noriyoshi; and Takahashi, Miyoshi, 4,082,974, Cl. 310-179.000.
Hitachi Printing Co. Ltd.: *See—*
Ueno, Tadayoshi; and Itaya, Akio, 4,082,038, Cl. 101-425.000.
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronics musical instrument. 4,082,027, Cl. 84-1.010.
Hochtemperatur-Kernkraftwerk GmbH, Gemeinsames Europaisches Unternehmen: *See—*
Schweiger, Fritz, 4,082,609, Cl. 176-86.00R.
Hodges, Joseph L.; and Green, Glen R., to Ore-Ida Foods, Inc. Potato strip cutter. 4,082,024, Cl. 83-402.000.
Hodgkins, Charles E.: *See—*
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Hodgson, Brian; Fairnington, Robert; Thorneycroft, Malcolm; and Grant, Ronald Malcolm, to Charles Churchill Limited. Gear hobbing machines. 4,082,031, Cl. 90-4.000.
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Andrascheck, Hans-Joachim; Lorcher, Otfried; and Zentner, Erich, 4,082,711, Cl. 260-23.0XA.
Burg, Karlheinz; and Schlaf, Helmut, 4,082,729, Cl. 260-67.0FP.
Eiglmeier, Kurt, 4,082,807, Cl. 260-590.00R.
Fuchs, Otto; and Troster, Helmut, 4,082,769, Cl. 260-328.000.
Harbeck, Alfred; Rebhan, Dieter; and Walburg, Richard, 4,082,300, Cl. 277-123.000.
Heinze, Christoph; Ruchlak, Kasimir; and Steude, Holm, 4,082,659, Cl. 210-23.00F.
Hertel, Hasso, 4,082,503, Cl. 8-44.000.
Hunger, Klaus; and Weber, Dieter, 4,082,741, Cl. 260-154.000.
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, 4,082,723, Cl. 260-45.80N.
Mees, Bernhard; and Ribka, Joachim, 4,082,501, Cl. 8-26.000.
Mohr, Reinhard; Mundlos, Eberhard; and Hohmann, Kurt, 4,082,740, Cl. 260-146.00R.
Moraw, Roland; and Dryczynski, Kurt, 4,083,054, Cl. 346-151.000.
Paszthory, Emmerich; Mees, Bernhard; and Hille, Ernst, 4,082,803, Cl. 260-575.000.
Pistorius, Rudolf; and Millauer, Hans, 4,082,809, Cl. 260-611.00R.
Riemenschneider, Wilhelm; and Wegener, Peter, 4,082,796, Cl. 260-545.00R.
Schroter, Herbert, 4,082,456, Cl. 355-109.000.
von der Eltz, Hans-Ulrich; Reuther, Albert; and Wassmuth, Hans-Joachim, 4,082,502, Cl. 8-34.000.
von der Eltz, Hans-Ulrich, 4,082,504, Cl. 8-44.000.
Hoeck, Horst: *See—*
Rautenbach, Robert; Hoeck, Horst; and Beer, Wolfgang, 4,081,914, Cl. 34-92.000.
Hoegerle, Karl; and Berrer, Dagmar, to Ciba-Geigy Corporation. Pyrimidine derivatives. 4,082,535, Cl. 71-92.000.
Hoehn, Ralf: *See—*
Boe, Hans; Hoehn, Ralf; Tecl, Bohuslav; and Kirsch, Wilhelm, 4,082,878, Cl. 428-195.000.
Hoffman, Douglas. Milling wheels for small flour mills. 4,082,234, Cl. 241-248.000.
Hoffman, Robert K.; and Franson, David C., to Parker-Hannifin Corporation. Automatic drain valve for a compressed air system. 4,082,107, Cl. 137-195.000.
Hoffmann, Kurt, to Siemens Aktiengesellschaft. Regenerating amplifier for CCD arrangements. 4,082,963, Cl. 307-221.00D.
Hoffmann-La Roche Inc.: *See—*
Grimmell, William Charles; Kaetzel, Gilbert Carl; Moran, John Milton; and Zanko, George Michael, 4,082,188, Cl. 209-73.000.
McGregor, Weldon Courtney; Newmark, Harold Leon; and Ramel, Armin Hermann, 4,082,737, Cl. 260-112.50R.
Hohmann, Kurt: *See—*
Mohr, Reinhard; Mundlos, Eberhard; and Hohmann, Kurt, 4,082,740, Cl. 260-146.00R.
Holden, Gordon Alan, to Crimpfil Limited. Production of bulky, continuous filament yarn. 4,081,887, Cl. 28-271.000.
Holderic, Jean: *See—*
Vrancken, August; Dufour, Paul; Noat, Jacques; and Holderic, Jean, 4,082,710, Cl. 260-23.0TN.
Hollowell, William M., to American Safety Equipment Corporation. Pawl seat back latch mechanism. 4,082,353, Cl. 297-379.000.
Holstein und Kappert Aktiengesellschaft: *See—*
Kurreck, Manfred, 4,082,492, Cl. 425-451.000.
Holt, Jan D.: *See—*
Hammonds, James C.; and Holt, Jan D., 4,082,043, Cl. 105-182.00R.
Holtz, Hans D.; Nelson, William T.; and Devault, Albert N., to Phillips Petroleum Company. Additives for motor fuels and lubricants. 4,082,518, Cl. 44-72.000.
Holznagel, Wilhelm: *See—*
Stephan, Bernd; Hund, Franz; and Holznagel, Wilhelm, 4,082,905, Cl. 428-538.000.
Honda, Yuitsu: *See—*
Ichikawa, Yataro; Sawaki, Toru; and Honda, Yuitsu, 4,082,804, Cl. 260-584.00R.
Honeywell Inc.: *See—*
Diddens, Paul A., 4,083,040, Cl. 340-248.00A.
Lapchak, Markian; and Curtis, Henry H., Jr., 4,082,449, Cl. 355-69.000.
Quinn, Peter T., 4,083,057, Cl. 354-25.000.
Hongu, Masayuki: *See—*
Hamada, Takeshi; Ishigaki, Yoshio; and Hongu, Masayuki, 4,083,019, Cl. 331-113.00R.
Honig, Helmut. Measuring arrangement. 4,082,642, Cl. 204-299.0EC.
Hooker Chemicals & Plastics Corporation: *See—*
Dannels, Bobby F., 4,082,712, Cl. 260-28.00R.
Houston, James E.; Gingrich, Reynard W.; and Schilt, Earl A., 4,082,606, Cl. 159-27.00B.
Hoover Ball and Bearing Company: *See—*
Mandusky, Jack C., 4,082,256, Cl. 267-81.000.
Hori, Sankichi: *See—*
Tanaka, Yoshio; Shibata, Tatsuo; Matsuo, Tatsuo; Takashima, Tadao; and Hori, Sankichi, 4,082,252, Cl. 266-142.000.
Horn, Charles F.; Lerch, Arthur L.; Turckes, Raymond J.; and Nagel, Ronald P., to Vulcan Tool Company, The. Tube cutting apparatus. 4,082,022, Cl. 83-82.000.
Hornbeck, Donald W.; and O'Loughlin, James P., to United States of America, Army. High voltage pulser. 4,082,965, Cl. 307-260.000.
Horne, Monroe D. Non-polluting tar kettle assembly. 4,082,083, Cl. 126-343.50A.
Hornle, Reinold: *See—*
Nonn, Konrad; Wolf, Karlheinz; and Hornle, Reinold, 4,082,505, Cl. 8-85.00R.
Hoshi, Hideaki: *See—*
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, 4,082.912, Cl. 544-26.000.
Hoshijima, Tokitaro: *See—*
Yamawaki, Takeshi; Hoshijima, Tokitaro; and Mizushima, Kiyoshi, 4,081,994, Cl. 73-95.000.
Houdaille Industries, Inc.: *See—*
Mossner, William Arno; and Mueller, Gerald Edwin, 4,082,472, Cl. 408-57.000.
House, Robert E.; Irvin, Robert A.; and Kane, Daniel F., to Semicon, Inc. High intensity solar energy converter. 4,082,570, Cl. 136-89.0SJ.
Houston, James E.; Gingrich, Reynard W.; and Schilt, Earl A., to Hooker Chemicals & Plastics Corporation. Evaporation apparatus. 4,082,606, Cl. 159-27.00B.
Howag AG: *See—*
Groninger, Markus, 4,083,030, Cl. 338-35.000.
Howmedica, Inc.: *See—*
Upshaw, Jackson E.; and Meisch, Charles Edward, 4,081,866, Cl. 3-1.911.
Howson, David C., to Isis Medical Instruments. Body contact electrode structure for deriving electrical signals due to physiological activity. 4,082,087, Cl. 128-2.06E.
Hradcovsky, Rudolf. Process for forming a silicate coating on metal. 4,082,626, Cl. 204-56.00R.
Hsu, Ying-Yen, to Suncrux Incorporated. Liquid crystal composition and method. 4,082,428, Cl. 350-350.000.
Huang, Kwang Ta: *See—*
Liu, Francis C.; and Huang, Kwang Ta, 4,081,962, Cl. 60-501.000.
Huber, John C.: *See—*
Ward, Joseph E., III; and Huber, John C., 4,082,429, Cl. 350-162.0SF.
Hudson, James M.: *See—*
Niswender, Gordon Dean; and Hudson, James M., 4,082,738, Cl. 260-121.000.
Hufford, James N., to CTS Corporation. Rotary switch. 4,082,925, Cl. 200-11.00G.
Hug, Josef H. Bicycle-training apparatus. 4,082,308, Cl. 280-296.000.
Hughes Aircraft Company: *See—*
Sun, Tsu-Hung; and Basiulis, Algerd, 4,082,109, Cl. 137-340.000.
Hughes, James L. Flower decoration. 4,082,872,. Cl. 428-24.000.
Hughes, Robert S., to Erecto-Pat Company. System and apparatus for interconnecting structural members, and method of utilizing same. 4,081,940, Cl. 52-712.000.
Hughes Tool Company: *See—*
Finney, James L., 4,082,151, Cl. 173-119.000.
Whitworth, Billie J., 4,082,152, Cl. 173-119.000.
Hull, James R. Article of furniture. 4,081,868, Cl. 5-12.00R.
Hummert, George T.: *See—*
Sackin, Milton; and Hummert, George T., 4,082,164, Cl. 187-29.00R.
Humphrey, Norman J. Advertising folder. 4,081,921, Cl. 40-120.000.

Hund, Franz: *See—*
Stephan, Bernd; Hund, Franz; and Holznagel, Wilhelm, 4,082,905, Cl. 428-538.000.
Hunger, Klaus; and Weber, Dieter, to Hoechst Aktiengesellschaft. Disazo pigments derived from 3,8-diamino-phenanthridone-(10). 4,082,741, Cl. 260-154.000.
Hunter, Donald Noel, to U.S. Philips Corporation. Light-sensitive polymeric compounds. 4,082,556, Cl. 96-115.00R.
Hunter, John P., Jr.: *See—*
Patterson, Thomas K.; Mitchell, William O.; Smith, Donald H.; and Hunter, John P., Jr., 4,082,589, Cl. 156-98.000.
Hurd, Claude Calvert: *See—*
Fry, Stanley Eugene; and Hurd, Claude Calvert, 4,082,093, Cl. 128-142.200.
Hurt, William C., II; Miers, Bruce W.; and Mossner, Eugene O. Resiliently mounted cab-sidewall retainer. 4,082,343, Cl. 296-28.00C.
Huseby, Irvin C.: *See—*
Arendt, Ronald H.; Borom, Marcus P.; Huseby, Irvin C.; and Klug, Frederic J., 4,082,566, Cl. 134-2.000.
Hutai, Hubert; Klie, Wolfgang; and Weisshappel, Helmut, to Daimler-Benz Aktiengesellschaft. Shock absorber fashioned as an elastomeric hollow spring. 4,082,338, Cl. 293-85.000.
Hutchings, Le Roi E.; and Sahlin, Thomas E., to UOP Inc. Simultaneous and continuous hydrocracking production of maximum distillate and optimum lube oil base stock. 4,082,647, Cl. 208-78.000.
Hydril Company: *See—*
Wolff, Danny K.; Mott, James D.; and Colvin, Kenneth W., 4,082,147, Cl. 166-314.000.
Hydro-Quebec: *See—*
Dancy, Edna A.; and Vansant, James H., 4,082,863, Cl. 427-181.000.
Iannucci, Anthony. Bolster for physical therapy. 4,081,870, Cl. 5-340.000.
Ichikawa, Kiyoshi: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,082,027, Cl. 84-1.010.
Ichikawa, Yataro; Sawaki, Toru; and Honda, Yuitsu, to Teijin Limited. Process for preparing 2-amino-1-butanol by reaction of the tartarate with an alkaline earth metal compound. 4,082,804, Cl. 260-584.00R.
Idel, Vladimir Viktorovich. Wheelhead. 4,082,014, Cl. 76-43.000.
IEC Electronics Corporation: *See—*
Day, Willis E.; Danford, Glenn S.; and Johnson, Kenneth C., 4,082,919, Cl. 179-2.0EA.
Iga, Tadasu: *See—*
Nakagawa, Masataka; Iga, Tadasu; and Fukura, Akira, 4,082,802, Cl. 260-574.000.
Iida, Norihika; and Gobaru, Shigeto, to National Marineplastic Co., Ltd. Process for manufacturing a flexible cylindrical body. 4,082,590, Cl. 156-144.000.
Iijima, Sigeru, to NGK Spark Plug Co., Ltd. Process for producing highly ion-conductive porcelain. 4,082,826, Cl. 264-65.000.
Iimura, Seiji: *See—*
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, 4,082,912, Cl. 544-26.000.
Ikeda, Masao; Miyamoto, Shigeo; Nozawa, Thutomu; Kurobe, Akira; and Futsukaichi, Osamu, to Nihon Iyakuhin Kogyo Co., Ltd. 4-Benzazonine derivatives and process for preparation thereof. 4,082,744, Cl. 260-239.0BB.
Ikeda, Takatoshi: *See—*
Ouchi, Yoshio; and Ikeda, Takatoshi, 4,083,053, Cl. 346-75.000.
Illinois Tool Works, Inc.: *See—*
Erickson, Lloyd A., 4,082,030, Cl. 85-80.000.
Illman, Walter F.: *See—*
Malpass, Robert C.; Illman, Walter F.; and Conklin, Delano M., 4,082,883, Cl. 428-253.000.
Imaizumi, Fumitake; Nagaoka, Isao; Kurokawa, Mitsuo; and Komatsu, Koei, to Japan Synthetic Rubber Co., Ltd. Process for producing maleic anhydride adduct of high molecular weight 1,2-polybutadiene. 4,082,817, Cl. 260-879.000.
IMC Chemical Group, Inc.: *See—*
Frump, John Adams, 4,082,892, Cl. 428-332.000.
Imhof, Hugo, to S.A.F. Societe Agricole et Fonciere S.A. Process for making extruded cattle manure pellets. 4,082,532, Cl. 71-8.000.
Immunology Research Foundation, Inc.: *See—*
Burton, Lawrence; and Friedman, Frank, 4,082,732, Cl. 260-112.00B.
Burton, Lawrence; and Friedman, Frank, 4,082,733, Cl. 260-112.00B.
Imperial Chemical Industries Limited: *See—*
Burton, Arthur; and Reed, David Robert, 4,082,890, Cl. 428-328.000.
Cotton, Neil Trevor, 4,082,611, Cl. 195-28.00R.
Henman, Terence John; and Williams, Graham, 4,082,720, Cl. 260-42.150.
Hewertson, Warren, 4,082,724, Cl. 260-45.75B.
Kay, Ian Trevor, 4,082,536, Cl. 71-93.000.
Marshall, Clifford, 4,082,508, Cl. 8-139.100.
Imperial-Eastman Corporation: *See—*
Hiszpanski, Jan A., 4,082,471, Cl. 404-133.000.
Imperial Oil Limited: *See—*
Flynn, Peter Charles, 4,082,646, Cl. 208-11.00R.
Inamorato, Jack Thomas; and Salmen, Leo Augustus, to Colgate-Palmolive Company. Detergent composition containing distinctive, colored, non-staining soap particles. 4,082,682, Cl. 252-92.000.
Inokuma, Shun: *See—*
Yamahara, Takeshi; and Inokuma, Shun, 4,082,767, Cl. 260-326.14T.
Inoue, Tadanari: *See—*
Tada, Osamu; Nakagawa, Mutsuaki; Mori, Hiroshi; Wakasa, Yutaka; Kataoka, Koju; Inoue, Tadanari; and Uchiike, Hisayuki, 4,082,942, Cl. 364-111.000.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
Didier, Alain; and Letailleur, Jean-Luc, 4,082,541, Cl. 75-5.000.
Institut National des Radio-elements - Nationaal Instituut voor Radio-elementen, en abrege: "I.R.E.": *See—*
Depoitier, Jacques; and Vinchent, Romain, 4,082,952, Cl. 250-381.000.
Instytut Przemyslu Mleczarskiego: *See—*
Szadkowska, Maria; Pisarek, Jerzy; Dzik, Boleslaw; Staniak, Elzbieta; Lipniewska, Danuta; and Bijok, Franciszek, 4,082,853, Cl. 426-36.000.
International Business Machines Corporation: *See—*
Barkhuff, Earl D., 4,082,399, Cl. 339-75.00M.
Baumberger, John G.; Gazy, Michael A.; and Miller, William C., 4,082,263, Cl. 271-266.000.
DiStefano, Thomas Herman, 4,082,889, Cl. 428-328.000.
Engler, Edward Martin; Kaufman, Frank Benjamin; and Scott, Bruce Albert, 4,082,552, Cl. 96-38.400.
Gedney, Ronald Walker; and Rodite, Robert Richard, 4,082,394, Cl. 339-17.00M.
Lahiri, Syamal K., 4,083,029, Cl. 338-32.00S.
Miller, Lewis F., 4,081,901, Cl. 29-630.00R.
van de Goor, Adrianus Johannes; Pijlman, Hans; and van der Vleugel, Bernard Evert, 4,082,945, Cl. 235-419.000.
International Harvester Company: *See—*
Jennings, Marvin D.; and Schmidgall, Rolf E., 4,081,996, Cl. 73-141.00A.
International Minerals & Chemical Corporation: *See—*
Zachary, William A., 4,082,134, Cl. 164-157.000.
International Nickel Company, Inc., The: *See—*
Crosby, Jeffrey Norman, 4,082,625, Cl. 204-47.000.
Whittle, John Edward, 4,082,632, Cl. 204-129.650.
International Shoe Machine Corporation: *See—*
Vornberger, Walter; and Vornberger, Karl F., 4,082,060, Cl. 118-411.000.
International Standard Electric Corporation: *See—*
Thompson, George Horace Brooke; and Lovelace, David Francis, 4,082,419, Cl. 350-96.120.
International Telephone and Telegraph Corporation: *See—*
Levine, Arnold M., 4,083,007, Cl. 325-159.000.
Portnoy, Norman A.; and Anderson, David Paul, 4,082,617, Cl. 203-28.000.
InterRoyal Corporation: *See—*
Bennice, Richard L., 4,083,041, Cl. 340-255.000.
Intra-Pipe, Inc.: *See—*
Jones, Garnett E., 4,081,930, Cl. 51-411.000.
Invacare Corporation: *See—*
Haury, Gilbert E., 4,082,348, Cl. 297-45.000.
Iowa State University Research Foundation, Inc.: *See—*
Anderson, Clifton W.; Kubik, John J.; Pollock, Tom G.; Schlict, Larry J.; and Wilcox, Craig R., 4,082,198, Cl. 214-519.000.
IRI-E Kosan Corporation: *See—*
Tanaka, Yoshio; Shibata, Tatsuo; Matsuo, Tatsuo; Takashima, Tadao; and Hori, Sankichi, 4,082,252, Cl. 266-142.000.
Irvin Bros. (Fleet Works) Limited: *See—*
Hadden-Wight, Roger; and Johnson, Colin Stanley, 4,082,593, Cl. 156-230.000.
Irvin, Robert A.: *See—*
House, Robert E.; Irvin, Robert A.; and Kane, Daniel F., 4,082,570, Cl. 136-89.0SJ.
Ishigaki, Yoshio: *See—*
Hamada, Takeshi; Ishigaki, Yoshio; and Hongu, Masayuki, 4,083,019, Cl. 331-113.00R.
Ishii, Shigeki: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,082,027, Cl. 84-1.010.
Ishii, Susumu; and Suzuki, Tuneo, to Yoshida Kogyo K.K. Locking slider for sliding clasp fasteners. 4,081,883, Cl. 24-205.14R.
Ishino, Ken: *See—*
Otoshi, Yutaka; and Ishino, Ken, 4,082,560, Cl. 106-45.000.
Isis Medical Instruments: *See—*
Howson, David C., 4,082,087, Cl. 128-2.06E.
Istituto di Ricerca Finsider per la Riduzione Diretta S.p.A.: *See—*
Malgarini, Giansilvio; Pasero, Edoardo; Alitta, Giorgio; De Candida, Cristiano; and Raggio, Carlo, 4,082,545, Cl. 75-35.000.
Istomin, Evgeny Ivanovich; Ivanenko, Alexandr Fedorovich; Strekal, Leonid Pavlovich; Vasiliev, Adolf Alfonsovich; and Vaskin, Boris Denisovich. Cathode assembly of electron beam welding gun. 4,082,937, Cl. 219-121.0EB.
Itagaki, Takuo: *See—*
Nishikawa, Yukiyasu; and Itagaki, Takuo, 4,083,055, Cl. 354-23.00D.
Italchemi S.p.A. Istituto Chimico Farmaceutico: *See—*
Benigni, Fulvio; and Trevisan, Lucio, 4,082,760, Cl. 260-307.0FA.
Italimpianti S.p.A.: *See—*
Malgarini, Giansilvio; Pasero, Edoardo; Alitta, Giorgio; De Candida, Cristiano; and Raggio, Carlo, 4,082,545, Cl. 75-35.000.
Itaya, Akio: *See—*
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Ito, Kaoru: *See—*
Sasaki, Minoru; Hida, Yukihiro; Enokido, Tsuneo; and Ito, Kaoru, 4,082,540, Cl. 75-3.000.

Itoi, Hidenobu: *See—*
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Ivanenko, Alexandr Fedorovich: *See—*
Istomin, Evgeny Ivanovich; Ivanenko, Alexandr Fedorovich; Strekal, Leonid Pavlovich; Vasiliev, Adolf Alfonsovich; and Vaskin, Boris Denisovich, 4,082,937, Cl. 219-121.0EB.

Ivey, Hollis L. Mobile radio security device. 4,081,978, Cl. 70-58.000.

Iwamura, Junichi: *See—*
Morita, Toyoshige; Fujita, Isamu; and Iwamura, Junichi, 4,082,858, Cl. 426-597.000.

Iwata, Hiroshi, to West Electric Company, Ltd. Electric flash device with printed coil transformer. 4,082,984, Cl. 315-241.00P.

Iwata, Hiroshi; and Tsuzuki, Yu, to West Electric Company, Ltd. Flash and camera apparatus having a plurality of flash and daylight operation modes. 4,083,058, Cl. 354-128.000.

Iwersen, Gunter. Machine for identifying and counting coins or the like. 4,082,099, Cl. 133-3.00R.

Iyoda, Jun: *See—*
Nagata, Akira; and Iyoda, Jun, 4,082,727, Cl. 260-46.50G.

Izu, Masatsuga; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Continuous tone imaging film. 4,082,861, Cl. 427-56.000.

Jacuzzi Bros., Inc.: *See—*
Raab, Alfred, 4,082,091, Cl. 128-66.000.

Jaffe, Wolfgang; and Lukawich, Joseph James, to Singer Company, The. Knitting machine carriage with hall effect detecting means. 4,081,974, Cl. 66-75.200.

Jaklic, Albin, Jr.; and Stephens, Donald S., to Westinghouse Electric Corporation. Encapsulated electrical inductive apparatus. 4,082,916, Cl. 174-52.0PE.

Janssen Pharmaceutica N.V.: *See—*
van Wijngaarden, Ineke; Soudijn, Willem; Vandenberk, Jan; and Hens, Jozef Fr., 4,082,755, Cl. 260-293.600.

Janubetz, Joseph J.: *See—*
Boni, Richard R.; and Janubetz, Joseph J., 4,081,900, Cl. 29-624.000.

Japan Gasoline Co., Ltd.: *See—*
Ohtsu, Takao; Nakamura, Yukinobu; and Sugimoto, Akira, 4,082,997, Cl. 324-65.00R.

Japan Synthetic Rubber Co., Ltd.: *See—*
Imaizumi, Fumitake; Nagaoka, Isao; Kurokawa, Mitsuo; and Komatsu, Koei, 4,082,817, Cl. 260-879.000.

Jardin, Hans, to Webasto-Werk W. Baier GmbH & Co. Sunroof. 4,081,926, Cl. 49-210.000.

Jarvis, George A.: *See—*
Marfatia, Anil C.; and Jarvis, George A., 4,082,077, Cl. 126-197.000.

Jaworski, Eugene: *See—*
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,082,268, Cl. 273-1.00R.

Jenkins, David Henry, to Eagle Engineering Company Limited, The. Handling fluent media. 4,082,124, Cl. 141-65.000.

Jennings, John N. Board game apparatus. 4,082,284, Cl. 273-251.000.

Jennings, Marvin D.; and Schmidgall, Rolf E., to International Harvester Company. Force-measuring devices. 4,081,996, Cl. 73-141.00A.

Jensen, Gerald A.; Harvey, Ronald B.; Caulfield, Patrick J.; Putzke, Dwayne H.; and Strunc, Gerald R., to Pako Corporaton. Method and apparatus for read and print data. 4,082,943, Cl. 235-303.100.

Jochum, Peter: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer, 4,082,722, Cl. 260-42.430.

Joh, Yasushi. Hollow fiber permeability apparatus. 4,082,670, Cl. 210-195.00R.

Johannaber, Friedrich: *See—*
Brinkschroder, Franz-Jurgen; Sandquist, Axel; and Johannaber, Friedrich, 4,082,488, Cl. 425-204.000.

Johannisson, Maj-Britt, heir-at-law: *See—*
Johannisson, Tor Gustav Alberto, deceased; and Johannissbn, Tom, heir-at-law, 4,082,261, Cl. 271-69.000.

Johannisson, Tom, heir-at-law: *See—*
Johannisson, Tor Gustav Alberto, deceased; and Johannisson, Tom, heir-at-law, 4,082,261, Cl. 271-69.000.

Johannisson, Tor Gustav Alberto, deceased (by Johannisson, Maj-Britt, heir-at-law); and by Johannisson, Tom, heir-at-law, to Flodins Industri AB. Machine for the manufacture of objects of sheet shape. 4,082,261, Cl. 271-69.000.

Johannson, Richard James: *See—*
Friesen, Larry Dean; and Johannson, Richard James, 4,082,199, Cl. 214-672.000.

John E. Mitchell Company: *See—*
Blackburn, James R.; Smith, Dudley C.; Smith, Theo B., Jr.; and Morgan, Jerry N., 4,082,142, Cl. 165-76.000.

Johner, Michel: *See—*
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Johns-Manville Corporation: *See—*
Wise, Harry Honon, 4,081,935, Cl. 52-236.800.

Johnson, Colin Stanley: *See—*
Hadden-Wight, Roger; and Johnson, Colin Stanley, 4,082,593, Cl. 156-230.000.

Johnson, Curtis L. Continuous adjusting scaffold. 4,082,161, Cl. 182-82.000.

Johnson, Elias J. Double fish pole jigger. 4,081,922, Cl. 43-19.200.

Johnson & Johnson: *See—*
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Butterworth, George A. M.; and Elias, Robert T., 4,082,886, Cl. 428-284.000.
Zeitz, Vernon, 4,082,435, Cl. 350-269.000.

Johnson, Karin Ruth. Educational puzzle chair. 4,082,356, Cl. 297-442.000.

Johnson, Kenneth C.: *See—*
Day, Willis E.; Danford, Glenn S.; and Johnson, Kenneth C., 4,082,919, Cl. 179-2.0EA.

Johnson, Kenneth R., to Rexham Corporation. Machine and method for filling, introducing steam into, and sealing flexible pouches. 4,081,942, Cl. 53-22.00B.

Johnson, Lennart B. Cross country ski binding. 4,082,312, Cl. 280-615.000.

Johnson, Lloyd E. Sealing in fuel injection pumps. 4,082,072, Cl. 123-139.0AA.

Johnson, Manuel J. Chain secured cigarette lighter. 4,082,496, Cl. 431-343.000.

Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., to Phillips Petroleum Company. Acyclic monoolefin double-bond isomerization using a nonacidic supported nickel, iron or cobalt catalyst with either antimony or arsenic. 4,082,815, Cl. 260-683.200.

Johnson, Robert Lincoln, Jr., to Neotec Corporation. Optical analysis system having rotating filters. 4,082,464, Cl. 356-188.000.

Johst, Wolfgang; Friese, Axel; and Simon, Stefan, to Dr. Carl Hahn, GmbH. Method for making dimensionally stable articles. 4,081,884, Cl. 28-119.000.

Jolley, Michael Ralph John: *See—*
Evans, Delme; Jolley, Michael Ralph John; Ross, William James; and Swann, Brian Picton, 4,082,771, Cl. 260-332.20R.

Jones, Charles L.; and Aradio, Dominic, to Continental Water Conditioning Corporation. End point quality control light circuit. 4,082,666, Cl. 210-93.000.

Jones, Donald H., to Contraves-Goerz Corporation. Speed detector for use on a dc motor. 4,082,968, Cl. 310-68.00B.

Jones, Garnett E., to Intra-Pipe, Inc. Arrangement for cleaning a conduit. 4,081,930, Cl. 51-411.000.

Jones, George F.; and Leliaert, Raymond M., to Wheelabrator-Frye, Inc. Vibratory mill with drainage and classifying means. 4,081,929, Cl. 51-163.200.

Jones, Gordon H.; Moffatt, John G.; and Nestor, John J., Jr., to Syntex (U.S.A.) Inc. Novel immunological adjuvant compounds and methods of preparation thereof. 4,082,735, Cl. 260-112.50R.

Jones, Gordon H.; Moffatt, John G.; and Nestor, John J., Jr., to Syntex (U.S.A.) Inc. Novel immunological adjuvant compounds and methods of preparation thereof. 4,082,736, Cl. 260-112.50R.

Jones, Oscar F. Engine vent vapor filter and method of constructing same. 4,082,071, Cl. 123-119.00B.

Jones, Robert L., to University of Edinburgh, The University Court of the. Prostaglandins C_2. 4,082,789, Cl. 260-121.000.

Jones, Stanley Peter; and Watson, William Ferguson, to Emhart Limited. Method for transferring heat from a glass mold. 4,082,527, Cl. 65-83.000.

Jorkasky, Richard J., II: *See—*
Li, George S.; and Jorkasky, Richard J., II, 4,082,820, Cl. 260-879.000.

Josenhans, Frederick G. Billiard banking aid. 4,082,270, Cl. 273-2.000.

Jost, Max; and Wick, Arnold, to Ciba-Geigy Corporation. Arylaminoanthraquinones. 4,082,778, Cl. 260-378.000.

Jovanovic, Dragomir. Autoclave. 4,082,510, Cl. 21-96.000.

Juby, Peter Frederick; and Partyka, Richard Anthony, to Bristol-Myers Company. Therapeutic agents. 4,082,751, Cl. 260-256.40C.

Jumer, John F. Apparatus for incremental electro-processing of large areas. 4,082,638, Cl. 204-213.000.

Jung, Rolf, to Krauss u. Reichert, Spezialmaschinenfabrik GmbH & Co. Horizontal splitting apparatus. 4,082,021, Cl. 83-4.000.

Jurd, Leonard, to United States of America, Agriculture. Growth inhibitors for mosquito larvae. 4,082,814, Cl. 260-619.00R.

Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; Seipos, Andrew G.; and Castillo, Adolfo, to Automated Building Components, Inc. Methods for forming wooden joints. 4,081,893, Cl. 29-432.000.

Justice, James Conley; and Delli-Gatti, Frank A., Jr., to Coaltex, Inc. Apparatus for coal mining in-cutting and out-cutting. 4,082,362, Cl. 299-57.000.

Kabushiki Kaisha Elco International: *See—*
Tanaka, Michiaki; and Nonaka, Yoshimasa, 4,082,397, Cl. 339-49.00R.

Kabushiki Kaisha Ka-Pu: *See—*
Hayashi, Tadaaki; and Nakahara, Teruto, 4,082,434, Cl. 350-225.000.

Kabushiki Kaisha Ricoh: *See—*
Suzuki, Akira; Kubo, Keiji; Kunitake, Suguru; and Arai, Fumiaki, 4,082,902, Cl. 428-457.000.

Kachan, Mikhail Samuilovich: *See—*
Minin, Vladilen Fedorovich; Gambarov, Vitaly Stepanovich; Kachan, Mikhail Samuilovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; and Trishin, Jury Alexeevich, 4,081,982, Cl. 72-56.000.

Kaeding, W. W., to Mobil Oil Corporation. Production of aliphatic amines utilizing a crystalline aluminosilicate catalyst of ZSM-5, ZSM-11 or ZSM-21. 4,082,805, Cl. 260-585.00B.

Kaetzel, Gilbert Carl: *See—*
Grimmell, William Charles; Kaetzel, Gilbert Carl; Moran, John Milton; and Zanko, George Michael, 4,082,188, Cl. 209-73.000.

Kaido, Hiroyuki: *See—*
Sugiyama, Yuichi; Kaido, Hiroyuki; and Koyama, Tsuneo, 4,082,909, Cl. 526-4.000.

Kajimura, Hiroyuki: *See—*
Arai, Tatsuo; Hirano, Hironori; Kajimura, Hiroyuki; and Matsui, Masayuki, 4,082,132, Cl. 152-361.00R.

Kako, Yuji: *See—*
Aoki, Takao; Kako, Yuji; Kikuga, Toyoji; and Hatano, Keizo, 4,082,661, Cl. 210-40.000.

Kaloi, Cyril M., to United States of America, Navy. Electric monomicrostrip dipole antennas. 4,083,046, Cl. 343-700.0MS.

Kamachi, Hajime: *See—*
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, 4,082,912, Cl. 544-26.000.

Kameda, Nobuyuki; Hisada, Yoshio; Kato, Toshiro; and Fujinami, Akira, to Sumitomo Chemical Company, Limited. Halogenated N-(3,5-dihalophenyl)cyclopropanedicarboximides. 4,082,849, Cl. 424-274.000.

Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Kanazawa, Tomohisa, to Hitachi, Ltd. Method and apparatus for connecting leads of a rotor. 4,082,406, Cl. 339-112.00L.

Kammerer, Leo P.: *See—*
Fabian, Gordon R.; McCollum, James H.; and Kammerer, Leo P., 4,082,238, Cl. 244-17.130.

Kamyr Inc.: *See—*
Funk, Erwin D., 4,082,368, Cl. 302-14.000.

Kanazawa, Tomohisa: *See—*
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Kanazawa, Tomohisa, 4,082,406, Cl. 339-112.00L.

Kane, Daniel F.: *See—*
House, Robert E.; Irvin, Robert A.; and Kane, Daniel F., 4,082,570, Cl. 136-89.0SJ.

Kano, Fumio: *See—*
Yamada, Muneki; Hirata, Sadao; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,082,854, Cl. 426-106.000.

Kanotz, William Michael; Lockhart, William Robert; Piper, George Francis; Vesperman, William Charles; and Wilson, Max Kearns, to Western Electric Company, Inc. Insulating tinsel conductors. 4,082,585, Cl. 156-51.000.

Kanow, Willy, to Loewe-Opta GmbH. Automatic function setting and indication arrangement for a communications receiver. 4,083,012, Cl. 325-455.000.

Kao, Ming-Luh: *See—*
Kushin, George Raymond; and Kao, Ming-Luh, 4,083,042, Cl. 340-324.00M.

Kaplan, Paul. Marker and vaporizable dispersible dye inks and process for using same. 4,082,467, Cl. 401-199.000.

Katagi Coseikagaku Kabushiki Kaisha: *See—*
Katagi, Fusao, 4,082,598, Cl. 156-463.000.

Katagi, Fusao, to Katagi Coseikagaku Kabushiki Kaisha. Apparatus for manufacturing an untwisted synthetic resin string. 4,082,598, Cl. 156-463.000.

Kataoka, Koju: *See—*
Tada, Osamu; Nakagawa, Mutsuaki; Mori, Hiroshi; Wakasa, Yutaka; Kataoka, Koju; Inoue, Tadanari; and Uchiike, Hisayuki, 4,082,942, Cl. 364-111.000.

Kato, Toshiro: *See—*
Kameda, Nobuyuki; Hisada, Yoshio; Kato, Toshiro; and Fujinami, Akira, 4,082,849, Cl. 424-274.000.

Katz, Rodney S.: *See—*
Glista, Andrew S.; and Katz, Rodney S., 4,082,423, Cl. 350-96.230.

Katzen, Sol. Conversion of cellulose and lignin organic waste material into a more digestible and manageable form. 4,082,859, Cl. 426-636.000.

Kaufman, Frank Benjamin: *See—*
Engler, Edward Martin; Kaufman, Frank Benjamin; and Scott, Bruce Albert, 4,082,552, Cl. 96-38.400.

Kawaguchi, Hiroshi: *See—*
Nakamura, Hiroyuki; Kawaguchi, Hiroshi; and Nishiwaki, Kiyoshi, 4,083,032, Cl. 340-71.000.

Kawakami, Sumio: *See—*
Ohuchi, Hirobumi; Kawakami, Sumio; and Okamura, Masahiro, 4,083,062, Cl. 357-13.000.

Kawakami, Takamasa: *See—*
Saito, Masao; Onozawa, Mamoru; Sasagawa, Kaoru; and Kawakami, Takamasa, 4,082,786, Cl. 260-465.00C.

Kay, Ian Trevor, to Imperial Chemical Industries Limited. Heterocyclic compounds and their use as pesticides. 4,082,536, Cl. 71-93.000.

Keeler Corporation: *See—*
Watt, William Doyle, Jr.; and Flowerday, Dale L., 4,082,243, Cl. 248-205.00R.

Keene Corporation: *See—*
Haack, William M., 4,082,640, Cl. 204-279.000.

Keeney, Joseph G., to C. H. Heist Corporation. Pressure relief valve. 4,082,104, Cl. 137-71.000.

Keiper KG: *See—*
Kluting, Bernd, 4,082,008, Cl. 74-531.000.

Keller, Alex J.; Dellinger, Keith Sidney; Ray, James Lester, Jr.; Cherry, Thomas Adrian; and Fechner, Erhard A., to Automatic Material Handling, Inc. Doffer with pneumatic control system. 4,081,949, Cl. 57-53.000.

Keller, Cornelius: *See—*
Berndt, Uwe; Erdmann, Bernhard; and Keller, Cornelius, 4,082,547, Cl. 75-122.700.

Kelley, Bruce G.: *See—*
Beggs, Donald; and Kelley, Bruce G., 4,082,543, Cl. 75-11.000.

Kelley, Clifford Herrol, Jr.: *See—*
Zangrando, Donald Roy; and Kelley, Clifford Herrol, Jr., 4,083,016, Cl. 331-56.000.

Kelley Company, Inc.: *See—*
Artzberger, Thomas G., 4,081,874, Cl. 14-71.700.

Kelley, Russell D., to Mead Corporation, The. The Production of a color developing record sheet containing metal-modified novolak resin particles. 4,082,713, Cl. 260-29.300.

Kellner, Jackson M., to Smith International, Inc. Tandem roller stabilizer for earth boring apparatus. 4,082,373, Cl. 308-4.00A.

Kelly, Donald A. Magnetic torque converter. 4,082,969, Cl. 310-103.000.

Kelly, Earl M., to Envirotech Corporation. Sludge thickening apparatus. 4,082,671, Cl. 210-195.00S.

Kelly, Joseph B., to PPG Industries, Inc. Apparatus for grinding a rabbet in an edge of a glass sheet. 4,081,927, Cl. 51-101.00R.

Kelly, Joseph B., to PPG Industries, Inc. Glass bending press with offset hinges. 4,082,529, Cl. 65-273.000.

Kelly, Robert C.; and Nelson, Norman A., to Upjohn Company, The. 6-Alkoxy-4α-hydroxy-2β-tetrahydropyranacetic acid γ-lactones. 4,082,776, Cl. 260-343.600.

Kendall, Ernest G.; and Pepper, Roger T., to Fiber Materials, Inc. Reinforced metal matrix composite. 4,082,864, Cl. 427-248.00B.

Kendrena, Carl M. Ski-sled. 4,082,304, Cl. 280-12.0KL.

Kennecott Copper Corporation: *See—*
George, David B., 4,082,542, Cl. 75-5.000.

Kennedy, John M.; and Kennedy, William R. Door for a mine stopping. 4,082,331, Cl. 292-228.000.

Kennedy, William R.: *See—*
Kennedy, John M.; and Kennedy, William R., 4,082,331, Cl. 292-228.000.

Kent, Harry James; and Pietrusza, Arthur Jacob, to Dravo Corporation. Pivot arrangement for a rotary drum assembly. 4,082,489, Cl. 425-222.000.

Kepets, Peter. Processing printed circuit boards. 4,082,605, Cl. 156-656.000.

Kessler, Henry A.; and Ying, Phyllis, to Warner-Lambert Company. Cure material from liquid polythiopolymercaptan polymers for dental impression taking. 4,082,693, Cl. 252-430.000.

Kesten, Stephen J.: *See—*
Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, 4,082,757, Cl. 260-294.80C.

Keydell, Willi; and Binder, Herbert, to Carl Zeiss-Stiftung. Binocular barrel with adjustable interpupillary distance and target marker support. 4,082,418, Cl. 350-10.000.

Khotin, Vladimir Alexeevich: *See—*
Bortnichuk, Nikolai Iosifovich; Davydov, Valery Pavlovich; Krutyansky, Mikhail Mironovich; Malinovsky, Vladimir Sergeevich; and Khotin, Vladimir Alexeevich, 4,082,914, Cl. 13-2.00P.

Khutoretsky, Garri Mikhailovich: *See—*
Azarov, Evgeny Mikhailovich; Andrushev, Valery Nikolaevich; and Khutoretsky, Garri Mikhailovich, 4,082,975, Cl. 310-239.000.

Kiely, William L.: *See—*
Pedersen, Kristen I.; and Kiely, William L., 4,081,872, Cl. 9-8.00P.

Kikuchi, Tatsuo: *See—*
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,082,628, Cl. 204-64.00T.

Kikuga, Toyoji: *See—*
Aoki, Takao; Kako, Yuji; Kikuga, Toyoji; and Hatano, Keizo, 4,082,661, Cl. 210-40.000.

Kinkaid, Robert John; and Asick, John Carl, to AMP Incorporated. Flat flexible cable terminal and electrical connection. 4,082,402, Cl. 339-97.00C.

Kinnebrew, Gerald P.; Watkins, Bobby Mack; and Texas Instruments Incorporated. Silicon slice carrier block and plug assembly. 4,081,928, Cl. 51-131.000.

Kirby, John A., to Eli Lilly and Company. Methylenedioxybenzene -- improved method of preparation. 4,082,774, Cl. 260-340.500.

Kirchmayr, Rudolf: *See—*
Schmidt, Andreas; and Kirchmayr, Rudolf, 4,082,821, Cl. 260-946.000.

Kirkpatrick, Allen R., to Simulation Physics, Inc. Apparatus involving pulsed electron beam processing of semiconductor devices. 4,082,958, Cl. 250-492.00B.

Kirkpatrick, Joel L., to Gulf Research & Development Co. Combating insects and mites with 1-carbamyl-4H-1,2,4-triazolin-5-ones and thiones. 4,082,765, Cl. 260-308.00C.

Kirsch, Wilhelm: *See—*
Boe, Hans; Hoehn, Ralf; Tecl, Bohuslav; and Kirsch, Wilhelm, 4,082,878, Cl. 428-195.000.

Kirschner, Robert Kay, to Sundstrand Data Control, Inc. Head-up visual display system using on-axis optics with image window at the focal plane of the collimating mirror. 4,082,432, Cl. 350-174.000.

Kishimoto, Akira: *See—*
Yamada, Muneki; Hirata, Sadao; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,082,854, Cl. 426-106.000.

Kitamura, Nobuo: *See—*
Morisaki, Shigeyoshi; and Kitamura, Nobuo, 4,082,591, Cl. 156-150.000.

Klara, Charles J.: *See*—
Clymer, Wilbur L.; and Klara, Charles J., 4,082,491, Cl. 425-440.000.

Klaus, Frank A.: *See*—
Kuder, Alfred W., 4,082,475, Cl. 408-125.000.

Klaus, Franz; and Potrykus, Franz Johann, to said Franz Klaus, by said Franz Johann Potrykus. Axial thrust sliding bearing for centrifugal pumps and compressors. 4,082,380, Cl. 308-163.000.

Klebanoff, Leonard, to Elkay Electronics Ltd. Condenser plate assembly. 4,083,038, Cl. 340-244.00R.

Kleemann, Willi; and Beck, Cyril G., to Westinghouse Electric Corporation. Highcreep-resistant cobalt-base alloy. 4,082,548, Cl. 75-171.000.

Kleen, Gerhard; Schiemann, Heinz; and Allmendinger, Karl. Arrangement with inductive voltage transformers. 4,083,026, Cl. 336-70.000.

Klein, Gunter: *See*—
Pfeifer, Friedrich; and Klein, Gunter, 4,082,580, Cl. 148-31.550.

Klein, Hans-Dieter: *See*—
Leonhardt, Joachim; and Klein, Hans-Dieter, 4,081,993, Cl. 73-88.00R.

Klie, Wolfgang: *See*—
Hutai, Hubert; Klie, Wolfgang; and Weisshappel, Helmut, 4,082,338, Cl. 293-85.000.

Kling-Tecs, Inc.: *See*—
Roberts, John S., 4,081,886, Cl. 28-251.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Heckmann, Wolfgang, 4,082,675, Cl. 210-360.00R.

Kloots, Jacobus, to Applied Fiberoptics, Inc. Strain-relieved fiberoptic cable. 4,082,422, Cl. 350-96.230.

Klug, Frederic J.: *See*—
Arendt, Ronald H.; Borom, Marcus P.; Huseby, Irvin C.; and Klug, Frederic J., 4,082,566, Cl. 134-2.000.

Kluger, Wolfgang; and Neumann, Jurgen, to Polysius AG. Base for a fine material container. 4,082,205, Cl. 222-193.000.

Kluting, Bernd, to Keiper KG. Positioning mechanism for automotive seat, window or similar part. 4,082,008, Cl. 74-531.000.

Knabusch, Edward M.; and Shoemaker, Edwin J., to La-Z-Boy Chair Company. Lockable back on a sofa bed. 4,082,355, Cl. 297-440.000.

Knight, John H.; St. Cyr, Lewis A.; and Wilson, Omer L., to Superior Oil Company, The. Recovery of hydrocarbon values by controlled eduction and oxidation of oil shale. 4,082,645, Cl. 208-11.00R.

Knop, Karl, to RCA Corporation. Zero-order diffractive subtractive filter projector. 4,082,438, Cl. 353-97.000.

Knop, Karl, to RCA Corporation. Fabrication of rectangular relief profiles in photoresist. 4,082,453, Cl. 355-88.000.

Knopka, William N., to Avtex Fibers Inc. Method for producing a high modulus polyester yarn. 4,082,731, Cl. 260-75.00T.

Knor, Bernhard: *See*—
Bickl, Horst; Treiber, Helmut; Findeis, Gunter; Knor, Bernhard; Payrhammer, Bernd; and Fergg, Berthold, 4,082,465, Cl. 356-203.000.

Knowles, Alvis R.; and Foster, Harold S., to Eldon Industries, Inc. Soldering iron with replaceable heating element and a grounded handle and components thereof. 4,082,940, Cl. 219-239.000.

Knuth, Everett F. Electrician's wire stripping tool. 4,081,871, Cl. 7-107.000.

Kobe, Inc.: *See*—
Erickson, John W.; and Petrie, Harold L., 4,082,482, Cl. 417-408.000.

Kobe Steel, Ltd.: *See*—
Shimogori, Kazutoshi; Sato, Hiroshi; and Tomari, Haruo, 4,082,900, Cl. 428-469.000.

Koch, Kevin Errol. Vehicle sun-shade. 4,081,937, Cl. 52-309.100.

Kocsanyi, Laszlo; and Varga, Lajos, to Heves Megyer Tanacsi Epitoipare Vallalat. Continuously charged pipe-chamber feeder provided with divided or intermediate chamber for hydraulic material handling. 4,082,367, Cl. 302-14.000.

Koenig, Harvey Steven; and Raines, Russell Harold, to Union Carbide Corporation. Printing formulations. 4,082,506, Cl. 8-91.000.

Koga, Tetsuaki, to Kokudo Doro Company Ltd. Method and apparatus of cleaning dust-containing gases. 4,082,522, Cl. 55-95.000.

Kohno, Hideki; Hashizume, Akihide; and Yamamoto, Shinji, to Hitachi, Ltd. Leukocyte detector. 4,082,457, Cl. 356-39.000.

Kok, Johannes George Jacobus; van Moorselaar, Rudolf; and Noordermeer, Aart, to U.S. Philips Corporation. 1,4-Bis(1-cyano-carbocyclic-unsaturater hydrocarbyl) dye compositions. 4,082,721, Cl. 260-42.210.

Kokudo Doro Company Ltd.: *See*—
Koga, Tetsuaki, 4,082,522, Cl. 55-95.000.

Kolaian, Jack H.; Patterson, John A.; and Ward, Frank K., to Texaco Inc. Method of preparing secondary alkylammonium 3-secondary alkylaminoalkanoates. 4,082,792, Cl. 260-501.110.

Kolleck, Floyd W., to United States of America, Energy. Holder for rotating glass body. 4,082,531, Cl. 65-296.000.

Komatsu, Koei: *See*—
Imaizumi, Fumitake; Nagaoka, Isao; Kurokawa, Mitsuo; and Komatsu, Koei, 4,082,817, Cl. 260-879.000.

Kominiak, Andrew A.: *See*—
Storck, Glenn E.; and Kominiak, Andrew A., 4,082,410, Cl. 339-252.00R.

Komuro, Takeo; Saito, Yukio; and Hirato, Mizuno, to Agency of Industrial Science & Technology, The. Thermal decomposition process and apparatus for organic solid materials. 4,082,615, Cl. 201-12.000.

Konars, Clement R.; and Quinci, Emanuel, to Halm Instrument Co., Inc. Feeder hopper for documents. 4,082,262, Cl. 271-149.000.

Kondratiev, Anatoly Dmitrievich: *See*—
Burgsdorf, Vladimir Vladimirovich; Genrikh, Georgy Andreevich; Nikonets, Leonid Alexeevich; Mishin, Valery Vasilievich; Kuznetsov, Viktor Yakovlevich; and Kondratiev, Anatoly Dmitrievich, 4,082,962, Cl. 307-147.000.

Kopelev, Fridrikh Lvovich. Machine for precision boring operations. 4,082,476, Cl. 408-234.000.

Korn, Volker: *See*—
Franetzki, Manfred; Korn, Volker; and Prestele, Karl, 4,082,088, Cl. 128-2.080.

Kornat, Kazimierz F.: *See*—
Einchcombe, Kenneth C. G.; and Kornat, Kazimierz F., 4,082,167, Cl. 188-73.600.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. Penniclavine acetonide. 4,082,753, Cl. 260-285.500.

Kotlar, Daniel. Pendant, earring or piece of jewelry. 4,081,972, Cl. 63-31.000.

Kovacs, Louis A.: *See*—
Simmons, Frank B.; Bozsvai, Alex; Kovacs, Louis A.; and Gerbetz, Robert P., 4,082,381, Cl. 308-187.000.

Koyama, Tsuneo: *See*—
Sugiyama, Yuichi; Kaido, Hiroyuki; and Koyama, Tsuneo, 4,082,909, Cl. 526-4.000.

Kozhaev, Arkady Filippovich: *See*—
Shergov, Igor Vladimirovich; Slavinsky, Vladimir Danilovich; Fridlender, Lev Moiseevich; Zharinov, Valery Ivanovich; and Kozhaev, Arkady Filippovich, 4,082,938, Cl. 219-121.0EB.

Kozima, Yasuhiro, to Nihon Electronic Industry Co., Ltd. Splicing roller device for automatic paper splicing apparatus. 4,082,599, Cl. 156-504.000.

Kozuki, Naoto, to Caterpillar Mitsubishi Ltd. Noise reducing device for a track chain arrangement. 4,082,372, Cl. 305-57.000.

Krambrock, Wolfgang, to Waeschle Maschinenfabrik GmbH. Method and apparatus for charging bulk material to a plurality of receiving stations. 4,082,364, Cl. 302-28.000.

Krause, Hartmut; and Grassme, Ulrich, to Siemens Aktiengesellschaft. Dental X-ray diagnostic device. 4,082,953, Cl. 250-413.000.

Krauss u. Reichert, Spezialmaschinenfabrik GmbH & Co.: *See*—
Jung, Rolf, 4,082,021, Cl. 83-4.000.

Kreischer, Pieter Hubertus, to Lever Brothers Company. Liquid detergent. 4,082,684, Cl. 252-109.000.

Kristensson, Sten Krister: *See*—
Fex, Hans Jacob; Kristensson, Sten Krister; and Stamvik, Anders Robert, 4,082,779, Cl. 260-397.500.

Krob, Erwin; Weigl, Erwin; and Svoboda, Josef, to Gertsch AG. Safety ski binding. 4,082,315, Cl. 280-631.000.

Krohn, Duane D.; and Culbertson, Samuel W., to Binks Manufacturing Company. Roving cutter. 4,081,904, Cl. 30-128.000.

Krolak, Ronald L.; Cackley, George W.; Getz, Marvin G.; and Ritter, Arthur J., Jr., to Caterpillar Tractor Co. Drive mechanism having separable housing. 4,082,156, Cl. 180-9.620.

Kronogard, Sven-Olof, to United Turbine AB & Co. Compressor having two or more stages. 4,082,477, Cl. 415-120.000.

Krupinski, Kenneth C.: *See*—
Augustine, Harry G.; Krupinski, Kenneth C.; and Smith, Frank A., 4,082,823, Cl. 264-7.000.

Kruszecki, Steve. Battery cable connector. 4,082,401, Cl. 339-95.00B.

Krutyansky, Mikhail Mironovich: *See*—
Bortnichuk, Nikolai Iosifovich; Davydov, Valery Pavlovich; Krutyansky, Mikhail Mironovich; Malinovsky, Vladimir Sergeevich; and Khotin, Vladimir Alexeevich, 4,082,914, Cl. 13-2.00P.

Kubik, John J.: *See*—
Anderson, Clifton W.; Kubik, John J.; Pollock, Tom G.; Schlict, Larry J.; and Wilcox, Craig R., 4,082,198, Cl. 214-519.000.

Kubo, Keiji: *See*—
Suzuki, Akira; Kubo, Keiji; Kunitake, Suguru; and Arai, Fumiaki, 4,082,902, Cl. 428-457.000.

Kubota, Ltd.: *See*—
Nakajima, Toshi; Sagara, Takao; and Hagio, Shohachiro, 4,082,321, Cl. 285-39.000.

Kuder, Alfred W., to Klaus, Frank A. High speed reamer attachment for coaxial drive fastener gun. 4,082,475, Cl. 408-125.000.

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Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,082,717, Cl. 260-345.90R.

Kulp, Jack H.; and Florsheim, James M., to Royal Industries, Inc. Traffic control element. 4,083,033, Cl. 340-114.00R.

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Kurobe, Akira: *See*—
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Kurokawa, Mitsuo: *See*—
Imaizumi, Fumitake; Nagaoka, Isao; Kurokawa, Mitsuo; and Komatsu, Koei, 4,082,817, Cl. 260-879.000.

Kurosaki, Shiro: *See*—
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,082,420, Cl. 350-96.310.

Kurreck, Manfred, to Holstein und Kappert Aktiengesellschaft. Mold closing apparatus. 4,082,492, Cl. 425-451.000.

Kushin, George Raymond; and Kao, Ming-Luh, to Milgo Electronic Corporation. Continuous quantitative signal-display system using light-emitting elements. 4,083,042, Cl. 340-324.00M.

Kushner, Benjamin: *See—*
Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; Seipos, Andrew G.; and Castillo, Adolfo, 4,081,893, Cl. 29-432.000.

Kuusik, Uno, to Chrysler Corporation. Centrifugal force hydraulic governor. 4,082,103, Cl. 137-54.000.

Kuwada, Yutaka; Meguro, Kanji; and Tawada, Hiroyuki, to Takeda Chemical Industries, Ltd. Methods for the production of 4H-s-triazolo[4,3-a][1,4]benzodiazepine 5N-oxides. 4,082,764, Cl. 260-308.00R.

Kuznetsov, Viktor Yakovlevich: *See—*
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Lamarre, Cerge Rudolf Maxime, 4,081,881, Cl. 16-162.000.

La Breche, Ferdinand J. Direction and slope indicating putter head. 4,082,286, Cl. 273-162.00B.

La Ferla, Vivian R.; Moreau, Janine E.; and Rodrigues, Mariano. Three-dimensional board game. 4,082,283, Cl. 273-241.000.

Lagana', Vincenzo: *See—*
Zardi, Umberto; Lagana', Vincenzo; Bonetti, Andrea; and Schmid, Giorgio, 4,082,797, Cl. 260-555.00A.

Lahiri, Syamal K., to International Business Machines Corporation. Thin film resistors and contacts for circuitry. 4,083,029, Cl. 338-32.00S.

Lake, Peter B.; Grenawalt, John J.; and Pastorek, Ronald L., to Youngstown Sheet and Tube Company. Ultra-high strength low alloy titanium bearing flat rolled steel and process for making. 4,082,576, Cl. 148-12.00F.

Lalin, Andre; and Brisabois, Roger, to Regie Nationale des Usines Renault. Rotary plate carrier drum for multi-plate clutches or brakes. 4,082,171, Cl. 192-70.200.

Lamarre, Cerge Rudolf Maxime, to Labelle, R. Folding closure. 4,081,881, Cl. 16-162.000.

Lampietti, Bernard P.; and Cavagnero, Erman V., to Torin Corporation. Apparatus and method for making wheel rim blanks and the like. 4,082,935, Cl. 219-9.500.

Landrum, Charles Rabun: *See—*
Calvert, Rodney K.; and Landrum, Charles Rabun, 4,081,945, Cl. 53-186.000.

Lane, Gordon Brandon, Jr. Modular chest back pack. 4,082,208, Cl. 224-8.00R.

Laney, David F. Magnetic bearing plotting and sighting device. 4,081,912, Cl. 33-272.000.

Lanfermann, Willy, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Rack device for a mining machine. 4,082,361, Cl. 299-43.000.

Lang, Otis C. Three-dimensional, layered, self sealing target. 4,082,280, Cl. 273-102.00B.

Lange, Karl Heinz, to Balda-Werke Photographische Gerate & Kunststoff GmbH. & Co. KG. Camera mechanism providing for relative movement of components against frictional resistance. 4,083,060, Cl. 354-286.000.

Lapchak, Markian; and Curtis, Henry H., Jr., to Honeywell Inc. Latensifying apparatus. 4,082,449, Cl. 355-69.000.

Laridon, Urbain Leopold; Poot, Albert Lucien; and Willems, Jozef Frans, to AGFA-GEVAERT N.V. Thermographic material. 4,082,901, Cl. 428-480.000.

Larsen, Larry D., to Patent Development & Management Company. Detection circuit. 4,083,037, Cl. 340-237.00S.

LaSalle, LeRoy: *See—*
Teague, J. T., 4,082,193, Cl. 214-2.500.

Laserplane Corporation: *See—*
Teach, Ted L., 4,081,919, Cl. 37-103.000.

Laskaris, Evangelos T., to General Electric Company. Uniformly-cooled superconducting rotor. 4,082,967, Cl. 310-64.000.

Lassman, Howard B.; and Novick, William J., Jr., to American Hoechst Corporation. Method of treating dermal inflammations. 4,082,850, Cl. 424-278.000.

Lattin, William Walter, to Motorola, Inc. MOS analog to digital converter. 4,083,045, Cl. 340-347.0AD.

Laundy, James R., to Tenneco Inc. Coupling device for connecting a plurality of ports to one pipe. 4,082,325, Cl. 285-155.000.

Lavigne, Vernon W.: *See—*
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Lear Siegler, Inc.: *See—*
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Learmont, Robert P., to United States Steel Corporation. In situ solution mining technique. 4,082,358, Cl. 299-4.000.

Leasure, William C.; and Garcia, Luis, to Mira-Pak, Inc. Apparatus and method for producing packages with individual product-filled cells. 4,081,943, Cl. 53-26.000.

Leasure, William R.: *See—*
Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., 4,082,868, Cl. 427-329.000.

LeCossec, Jean: *See—*
Denamps, Jean; and LeCossec, Jean, 4,082,960, Cl. 307-118.000.

Lefebvre, Denis. Flame retention head assembly. 4,082,495, Cl. 431-183.000.

Lehman, Richard F., to Xerox Corporation. Compact illumination system for optically providing a structured photoreceptor charge distribution. 4,082,450, Cl. 355-71.000.

Leiber, Heinz; and Blasius, Udo, to Teldix G.m.b.H. Monitoring device for an antilocking brake control system. 4,082,370, Cl. 303-92.000.

Leidal, Shirley Margaret: *See—*
Wingard, Robert Dean; and Leidal, Shirley Margaret, 4,082,512, Cl. 23-252.00R.

Leliaert, Raymond M.: *See—*
Jones, George F.; and Leliaert, Raymond M., 4,081,929, Cl. 51-163.200.

Lemanski, Savarian F. Self-decoupling tap and die holder. 4,081,873, Cl. 10-89.00H.

Lenken, Thomas J., to Desco Corporation. Temperature indicator with limit detection apparatus. 4,081,999, Cl. 73-343.00R.

Lennon, David C., to General Electric Company. Male and female terminal combination. 4,082,412, Cl. 339-256.0SP.

Lennox Industries, Inc.: *See—*
Pfarrer, David M., 4,082,989, Cl. 318-224A.

Lentz, Carl A., to General Motors Corporation. Range shift control by input governor. 4,082,009, Cl. 74-731.000.

Lentz, Lawrence R., to Champion Spark Plug Company. Spark plug design having two electrically isolated center electrodes. 4,082,976, Cl. 313-135.000.

Leo Pharmaceutical Products Ltd.: *See—*
Feit, Peter Werner; Nielsen, Ole Bent Tvaermose; Bruun, Herta; and Bretting, Claus Aage Svensgaard, 4,082,851, Cl. 424-300.000.

Leonard, Richard L.: *See—*
Fritzsche, Alfred Keith; and Leonard, Richard L., 4,082,658, Cl. 210-22.00R.

Leonhardt, Joachim; and Klein, Hans-Dieter, to Bergwerksverband GmbH. Device for measuring the magnitude and direction of compression forces. 4,081,993, Cl. 73-88.00R.

Lerch, Arthur L.: *See—*
Horn, Charles F.; Lerch, Arthur L.; Turckes, Raymond J.; and Nagel, Ronald P., 4,082,022, Cl. 83-82.000.

Letailleur, Jean-Luc: *See—*
Didier, Alain; and Letailleur, Jean-Luc, 4,082,541, Cl. 75-5.000.

Leutwyler, Roy: *See—*
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Lever Brothers Company: *See—*
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Kreischer, Pieter Hubertus, 4,082,684, Cl. 252-109.000.
Pader, Morton, 4,082,841, Cl. 424-50.000.
Pugh, Brinley Roy, 4,081,876, Cl. 15-167.00R.

Lever, Paul H., to Fireplace Corporation of America. Chimney construction for heating fixtures. 4,082,322, Cl. 285-133.00R.

Levine, Arnold M., to International Telephone and Telegraph Corporation. Radar transmitter temporal noise reduction system. 4,083,007, Cl. 325-159.000.

Levine, Robert Aaron: *See—*
Wardlaw, Stephen Clark; Levine, Robert Aaron; and Massey, James Vincent, III, 4,082,085, Cl. 128-2.00G.

Levine, Walter E., to Bindicator Company. Method for manufacturing an ultrasonic transducer. 4,081,889, Cl. 29-25.350.

Li, George S.; and Dirks, Gary W., to Standard Oil Company, The. Rubber-modified acrylonitrile-vinyl ether-indene polymers. 4,082,819, Cl. 260-879.000.

Li, George S.; and Jorkasky, Richard J., II, to Standard Oil Company, The. High softening maleic anhydride copolymers. 4,082,820, Cl. 260-879.000.

Li, Ke Wen, to Continental Oil Company. Manufacture of petroleum coke with fines recycling. 4,082,650, Cl. 208-131.000.

Liao, Hsiang-Peng: *See—*
Fisher, Warren C.; Linder, Seymour M.; Pelley, Ralph L.; and Liao, Hsiang-Peng, 4,082,777, Cl. 260-348.250.

Lightolier Incorporated: *See—*
Donato, Anthony C.; and Russo, Neil, 4,082,395, Cl. 339-21.00R.

Liles, Donald T.; and Michael, Keith W., to Dow Corning Corporation. Silicone epoxy curable compositions. 4,082,719, Cl. 260-37.0SB.

Lilja, Pekka Juhani. Outer wall element. 4,081,933, Cl. 52-171.000.

Lilly Industries Limited: *See—*
Evans, Delme; Jolley, Michael Ralph John; Ross, William James; and Swann, Brian Picton, 4,082,771, Cl. 260-332.20R.

Liman, Sandy, to Scott USA, Inc. Ski glove or mitt. 4,081,864, Cl. 2-161.00A.

Lindell, Curt Oskar: *See—*
Nilsson, Karl Osten Alf; and Lindell, Curt Oskar, 4,082,260, Cl. 271-1.000.

Linder, Seymour M.: *See—*
Fisher, Warren C.; Linder, Seymour M.; Pelley, Ralph L.; and Liao, Hsiang-Peng, 4,082,777, Cl. 260-348.250.

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Smorzaniuk, Adam; and Lindlau, Paul F., 4,082,407, Cl. 339-112.00R.

Lindmayer, Joseph. Solar cell with multiple-metal contacts. 4,082,568, Cl. 136-89.0CC.

Lindstol, Anders, to Ecodyne Corporation. Filter and method. 4,082,664, Cl. 210-80.000.

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Heathman, John H.; and Lingley, Richard C., 4,082,240, Cl. 244-158.000.

Link, Edwin A., to RTE Corporation. Method of use and electrical equipment utilizing insulating oil consisting of a saturated hydrocarbon oil. 4,082,866, Cl. 427-294.000.

Lipniewska, Danuta: *See*—
Szadkowska, Maria; Pisarek, Jerzy; Dzik, Boleslaw; Staniak, Elzbieta; Lipniewska, Danuta; and Bijok, Franciszek, 4,082,853, Cl. 426-36.000.
Lipp, Xaver. Apparatus for producing a pipe from metal strip. 4,081,981, Cl. 72-49.000.
Lipscher, Ervin, to Medicor Muvek. Portable diagnostic device. 4,082,084, Cl. 128-2.00D.
Liquid Removal Service Co., Inc.: *See*—
Petroski, Alex, 4,082,672, Cl. 210-205.000.
Liske, Kenneth T.: *See*—
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Litton Systems, Inc.: *See*—
Marfatia, Anil C.; and Jarvis, George A., 4,082,077, Cl. 126-197.000.
Thuleen, Richard A.; and Richard, John E., 4,082,078, Cl. 126-197.000.
Litvan, Gerhard G.; and Sereda, Peter J., to Canadian Patents and Development Limited. Porous particles in frost-resistant cementitious materials. 4,082,562, Cl. 106-97.000.
Liu, Francis C.; and Huang, Kwang Ta. Dynamic wave energy extraction system. 4,081,962, Cl. 60-501.000.
Liu, Kang-Jen: *See*—
Chlanda, Frederick P.; Nagasubramanian, Krishnamurthy; and Liu, Kang-Jen, 4,082,835, Cl. 423-242.000.
Lloyd, Ruth Diane: *See*—
Schardein, Daniel Joseph; and Lloyd, Ruth Diane, 4,082,907, Cl. 428-640.000.
Lo, Cheng Fan: *See*—
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Locke, David Richard, to Sperry Rand Corporation. Cutter head assembly for an electric dry shaver. 4,081,902, Cl. 30-43.920.
Lockhart, William Robert: *See*—
Kanotz, William Michael; Lockhart, William Robert; Piper, George Francis; Vesperman, William Charles; and Wilson, Max Kearns, 4,082,585, Cl. 156-51.000.
Lockheed Corporation: *See*—
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Kanow, Willy, 4,083,012, Cl. 325-455.000.
Loew's Theatres, Inc.: *See*—
Chen, Leighton L., 4,082,950, Cl. 250-343.000.
Long, E. David, to Allied Chemical Corporation. Modulation for fuel density in fuel injection system. 4,082,066, Cl. 123-32.0EA.
Long, Walt C.; and Williams, Milton L., to United States of America, National Aeronautics and Space Administration. Non-destructive method for applying and removing instrumentation on helicopter rotor blades. 4,082,001, Cl. 73-756.000.
Lonseal Corporation: *See*—
Miura, Nobuo, 4,082,876, Cl. 428-159.000.
Looks, Arnold, to Conver Ingenieur-Technik GmbH & Co., KG. Coupling device for containers. 4,082,052, Cl. 114-75.000.
Loomba, Yogendra S.: *See*—
Stephenson, Robert L.; and Loomba, Yogendra S., 4,082,236, Cl. 242-107.40B.
Looschen, Floyd William, to Burroughs Corporation. Three-level serial digital data communication system. 4,083,005, Cl. 325-38.00A.
Looschen, Floyd William, to Burroughs Corporation. Receiving means for use in a digital data communication system. 4,083,010, Cl. 325-321.000.
Lorcher, Otfried: *See*—
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Lo Scalzo, Enzo; Ferre, Franco; and Cantoni, Gianfranco, to Societa' Italiana Resine S.I.R. S.p.A. Process for the emulsion polymerization of conjugated dienes. 4,082,714, Cl. 260-29.70R.
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Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, 4,081,895, Cl. 29-573.000.
Losert, Gerhard K., to General Electric Company. Clothes dryer air flow test device and method. 4,081,997, Cl. 73-168.000.
Lou, Perry W., to Texas Instruments Incorporated. MOS detector or sensing circuit. 4,082,966, Cl. 307-362.000.
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Lucifer S.A.: *See*—
Stampfli, Harald, 4,082,116, Cl. 137-630.140.
Lukawich, Joseph James: *See*—
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Lumma, William C., Jr.; and Saari, Walfred S., to Merck & Co., Inc. 6-Chloro-2-(1-piperazinyl)pyrazine. 4,082,844, Cl. 424-250.000.
Lumma, William C., Jr.: *See*—
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Lutz, David Edward: *See*—
Lutz, David William; and Lutz, David Edward, 4,082,196, Cl. 214-83.220.
Lutz, David William; and Lutz, David Edward. Loading and unloading apparatus for vehicles. 4,082,196, Cl. 214-83.220.
Lythgoe, Stanley; and Gelder, David, to Pilkington Brothers Limited. Glass melting tank with temperature control and method of melting. 4,082,528, Cl. 65-135.000.
M.C.P. Industries, Inc.: *See*—
Musbach, Alan Jon, 4,082,623, Cl. 204-43.00S.
M I Systems, Inc.: *See*—
Page, Dennis M.; and Bevilacqua, Albert J., 4,082,086, Cl. 128-2.06E.
Magee, Raymond J. Film viewer. 4,081,920, Cl. 40-362.000.
Magnagard Equipment & Manufacturing Corporation: *See*—
Putnam, Dean H., 4,082,454, Cl. 355-99.000.
Magnetic Controls Company: *See*—
Castleman, Cordell V., 4,082,920, Cl. 179-2.0DP.
Majcherczyk, Richard, to Centre Experimental de Recherches et d'Etudes du Batiment et des Travaux Publics. Device for measuring the stress of tangential friction of a shoe on a surfacing for the ground. 4,081,989, Cl. 73-9.000.
Malgarini, Giansilvio; Pasero, Edoardo; Alitta, Giorgio; De Candida, Cristiano; and Raggio, Carlo, to Istituto di Ricerca Finsider per la Riduzione Diretta S.p.A.; and Italimpianti S.p.A., part interest to each. Reduction of iron ore in fluidized bed reactors. 4,082,545, Cl. 75-35.000.
Malinovsky, Vladimir Sergeevich: *See*—
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Mallinckrodt, Inc.: *See*—
Chen, Jong C., 4,082,747, Cl. 260-2.59.570.
Malpass, Robert C.; Illman, Walter F.; and Conklin, Delano M., to Burlington Industries, Inc. Hot melt size, yarn sized therewith, and packages and fabrics of sized yarn. 4,082,883, Cl. 428-253.000.
Mandusky, Jack C., to Hoover Ball and Bearing Company. Seat assembly. 4,082,256, Cl. 267-81.000.
Mangus, Ervin E., to Caterpillar Tractor Co. Fuel injection nozzle. 4,082,224, Cl. 239-453.000.
Mann, Alfred E.; and Schulman, Joseph H., to Pacesetter Systems Inc. Multimode recharging system for living tissue stimulators. 4,082,097, Cl. 128-419.0PS.
Mann, Friedrich H.: *See*—
Ferrell, Sherwood W.; Mann, Friedrich H.; and Schaefer, Henry A., 4,083,011, Cl. 325-352.000.
Manthey, Willi Bruno; and Deiwick, Horst, to BWG Bergwerk- und Walzwerk-Maschinenbau GmbH. Apparatus for cooling hot slabs. 4,082,100, Cl. 134-76.000.
Mar-Kel Lighting, Inc.: *See*—
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Marathon Oil Company: *See*—
Andon, Nicholaki A.; and Fleece, Robert I., 4,082,513, Cl. 23-288.00E.
Mardon Flexible Packaging Limited: *See*—
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Marfatia, Anil C.; and Jarvis, George A., to Litton Systems, Inc. Oven door latch. 4,082,077, Cl. 126-197.000.
Marker, Hannes: *See*—
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Marks, Stephen W.; and Marsh, Robert E., to General Motors Corporation. Ignition distributor rotor with corona generating points of electrically conductive paint. 4,082,926, Cl. 200-19.0DR.
Marlow, Jerry R.: *See*—
Dornfeld, Kenneth A.; Marlow, Jerry R.; and Sanders, Robert K., 4,082,013, Cl. 74-866.000.
Marquis, Gerald L., to Dresser Industries, Inc. Method and apparatus for running and retrieving logging instruments in highly deviated well bores. 4,082,144, Cl. 166-250.000.
Marriott, Joe E., to Hewlett-Packard Company. Dual slope integration circuit. 4,082,998, Cl. 324-99.00D.
Marsh, Robert E.: *See*—
Marks, Stephen W.; and Marsh, Robert E., 4,082,926, Cl. 200-19.0DR.
Marshall, Clifford, to Imperial Chemical Industries Limited. Treatment of textile materials. 4,082,508, Cl. 8-139.100.
Marshall, J. Howard, III; and Harrington, Timothy M., to MDH Industries Inc. Unipolar wide-range current-to-frequency converter. 4,083,044, Cl. 340-347.0AD.
Martig, Kenneth W., Jr., to Pro-Tech, Inc. Flow stilling device. 4,081,998, Cl. 73-302.000.
Martin, Arthur Lee. Tennis practice and teaching rebounder. 4,082,271, Cl. 273-29.00A.
Martin, Frank Stephen; Melvin, Terence; and Pieroni, Joseph Kirby, to Uniroyal, Inc. Method of making adjuvant for elastomeric composition. 4,082,288, Cl. 273-218.000.
Martin, Joe E.: *See*—
Volta, Victor S.; and Martin, Joe E., 4,082,334, Cl. 292-288.000.
Martin Marietta Corporation: *See*—
Owen, William J., 4,082,462, Cl. 356-152.000.
Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,082,268, Cl. 273-1.00R.
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Masclet, Jean; and Veaux, Jacques, to Messier-Hispano S.A. Oleopneumatic damper. 4,082,255, Cl. 267-64.00R.
Massey-Ferguson Inc.: *See*—
Dwyer, Robert M., 4,081,961, Cl. 60-386.000.
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Massey, James Vincent, III: *See—*
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Materniak nee Babcerowicz, Gizela; and Materniak, Zdzislaw. Exhaust system for laundry dryer. 4,081,915, Cl. 34-235.000.
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Materniak nee Babcerowicz, Gizela; and Materniak, Zdzislaw, 4,081,915, Cl. 34-235.000.
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Matsushita, Toshihiko: *See—*
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Mattern, John; and Harrison, Earnest R., to Westinghouse Electric Corporation. Moving target radar. 4,083,049, Cl. 343-7.700.
Matthews, John C., to Diamond Power Specialty Corporation. Snubber assembly for a control rod drive. 4,082,610, Cl. 176-365.000.
Maul Technology Corporation: *See—*
Dininio, Thomas, 4,082,108, Cl. 137-269.500.
Mayburg, Sumner: *See—*
Birman, Joseph L.; and Mayburg, Sumner, 4,083,017, Cl. 331-94.50H.
Mayer, Hartmut, to Robert Bosch GmbH. Method and apparatus to determine the timing of cyclically repetitive events, particularly ignition instant for internal combustion engines. 4,082,069, Cl. 123-117.00D.
Mayer, Norbert; Pfahler, Gerhard; and Wiezer, Hartmut, to Hoechst Aktiengesellschaft. Aza-adamantane compound stabilizers for organic polymer compositions. 4,082,723, Cl. 260-45.80N.
Mazeke, Herbert F.: *See—*
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McCartney, Clyde B., to Parrow, Wayne; and Parrow, Harold, part interest to each. Wheeled undercarriage for snowmobiles. 4,082,155, Cl. 180-5.00R.
McColgan, John M.; and O'Brien, Philip F. Portable light-weight solar heater. 4,082,081, Cl. 126-271.000.
McCollum, James H.: *See—*
Fabian, Gordon R.; McCollum, James H.; and Kammerer, Leo P., 4,082,238, Cl. 244-17.130.
McCullough, John E., to Arthur D. Little, Inc. Scroll-type apparatus with fixed throw crank drive mechanism. 4,082,484, Cl. 418-55.000.
McDaniel, Ralph B.: *See—*
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McDermott, Hugh L., to Eaton Corporation. Fluid pressure device and improved Geroler ® for use therein. 4,082,480, Cl. 417-283.000.
McFadden, Robert L. Phonemic word game method. 4,082,279, Cl. 273-272.000.
McGahey, Dean C., to Texaco Inc. Closed fuel system with vacuum assist. 4,082,122, Cl. 141-5.000.
McGarvey, Jarvis M., to Carborundum Company, The. Endless abrasive belt, and laminated patch splice therefor. 4,082,521, Cl. 51-295.000.
McGee, Larry S.: *See—*
Estes, Ronald L.; McGee, Larry S.; and Welton, Sanford M., 4,082,526, Cl. 65-24.000.
McGrane, Earl F.: *See—*
McGrane, Merle V.; and McGrane, Earl F., 4,082,227, Cl. 239-675.000.
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Boni, Richard R.; and Janubetz, Joseph J., 4,081,900, Cl. 29-624.000.
McGregor, Weldon Courtney; Newmark, Harold Leon; and Ramel, Armin Hermann, to Hoffmann-La Roche Inc. Stabilized thymosin composition and method. 4,082,737, Cl. 260-112.50R.
McIlhinney, Allen E.: *See—*
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McIntyre, Donald B.; and McIntyre, Frederic S., to Acumeter Laboratories, Inc. Coating apparatus with intermittent substrate backup. 4,082,059, Cl. 118-407.000.
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McNally, George S.; Naik, Dilip T.; and Spence, John H., to Pullman Incorporated. Stability bracing for twist on high gondolas or hopper cars. 4,082,045, Cl. 105-411.000.
McPherson, John B.; and Gunther, William H., Jr., to Thor Dahl, Inc. Envelope opening process. 4,082,603, Cl. 156-654.000.
McQuinn, Ted M.; and Anderson, Richard B., to General Motors Corporation. Engine and transmission power train. 4,082,011, Cl. 74-862.000.
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McRae, Dougal Harold, to Rohm and Haas Company. Selective weed control with m-dinitrobenzene. 4,082,538, Cl. 71-125.000.
McWhorter, Delmer L. Door lock version. 4,082,330, Cl. 292-218.000.
MDH Industries Inc.: *See—*
Marshall, J. Howard, III; and Harrington, Timothy M., 4,083,044, Cl. 340-347.0AD.
Mead Corporation, The: *See—*
Calvert, Rodney K.; and Landrum, Charles Rabun, 4,081,945, Cl. 53-186.000.
Kelley, Russell D., 4,082,713, Cl. 260-29.300.
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Lipscher, Ervin, 4,082,084, Cl. 128-2.00D.
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Meisch, Charles Edward: *See—*
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Menon, Sukumaran K.; and Wenthe, Stephen J., Jr., to Xerox Corporation. Lamp carriage drive system. 4,082,444, Cl. 355-8.000.
Menth, Anton; Perry, Anthony J.; and Spinner, Ulrich, to BBC Brown, Boveri & Company, Limited. As - cast permanent magnet Sm-Co-Cu material, with iron, produced by annealing and rapid quenching. 4,082,582, Cl. 148-102.000.
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Merkel, Paul Barrett, to Eastman Kodak Company. Photothermographic materials and process. 4,082,555, Cl. 96-114.100.
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Myers, Mark Stanley; and Bowler, Richard George, 4,082,294, Cl. 274-47.000.
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Metzler, Gerhart; Rother, Peter; and Sukopp, Hans, to Geratewerk Lahr GmbH. Pick-up arm assemblies for record players. 4,082,291, Cl. 274-23.00R.
Meuller, Von W.; and Foerster, Ronald A., to GTE Automatic Electric Laboratories Incorporated. Windings for magnetic latching reed relay. 4,083,025, Cl. 335-153.000.

Meyer, Gerhard; and Toth, Anton, to Akzona Incorporated. Process for producing 3-hydrazino-4-amino-5-mercapto-1,2,4-triazole. 4,082,763, Cl. 260-308.00R.
Michael, Keith W.: *See*—
Liles, Donald T.; and Michael, Keith W., 4,082,719, Cl. 260-37.0SB.
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Midrex Corporation: *See*—
Beggs, Donald; and Kelley, Bruce G., 4,082,543, Cl. 75-11.000.
Miedema, Andries Rinse; Buschow, Kurt Heinz Jurgen; and Mulder, Jan, to U.S. Philips Corporation. Heat regenerator. 4,082,138, Cl. 165-4.000.
Miers, Bruce W.: *See*—
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Miki, Takuichi; Hiraga, Kentaro; and Goto, Giichi, to Takeda Chemical Industries, Ltd. Estradiol derivatives. 4,082,780, Cl. 260-397.500.
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Miller, Frederick L. B. Knife holder in log slabbing chipper. 4,082,127, Cl. 144-220.000.
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Miller, Richard G.; and Cavitt, Roy L., to PPG Industries, Inc. Electroless deposition of electrically nonconductive copper-boron coatings on nonmetallic substrates. 4,082,898, Cl. 428-427.000.
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Suzuki, Yoshio; Minai, Masayoshi; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, 4,082,913, Cl. 560-102.000.
Mine, Katsutoshi; and Yokoyama, Masuo, to Toray Silicone Company, Ltd. Curable organopolysiloxane compositions with improved adhesion. 4,082,726, Cl. 260-46.5UA.
Minin, Vladilen Fedorovich; Gambarov, Vitaly Stepanovich; Kachan, Mikhail Samuilovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; and Trishin, Jury Alexeevich. Plant for explosion working of materials. 4,081,982, Cl. 72-56.000.
Minnesota Mining and Manufacturing Company: *See*—
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Mishuku, Minoru; Edo, Taro; and Tsuchiya, Nobujiro, to Fuji Die Co., Ltd. Cemented carbide products and manufacturing method. 4,082,559, Cl. 106-43.000.
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Mohr, Reinhard; Mundlos, Eberhard; and Hohmann, Kurt, to Hoechst Aktiengesellschaft. Quaternary basic azodyestuffs containing a propenyl amino radical. 4,082,740, Cl. 260-146.00R.
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Moran, Paul R., to United States of America, Energy. Compton effect thermally activated depolarization dosimeter. 4,082,951, Cl. 250-336.000.
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Moreinis-Eisen, David. Equipment for the treatment of textiles in the form of hanks or webs with liquid or pastes. 4,081,976, Cl. 68-19.000.
Morelock, Donald L. Method and apparatus for shaping and planing boards. 4,082,129, Cl. 144-326.00R.
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tro Copper Sheet Co., Ltd. Surface treatment process for copper foil. 4,082,591, Cl. 156-150.000.
Morita, Toyoshige; Fujita, Isamu; and Iwamura, Junichi, to F. K. Suzuki International, Inc. Sweetening compound, method of recovery, and use thereof. 4,082,858, Cl. 426-597.000.
Moriyama, Hisa; and Moriyama, Toshiyuki. Massaging instrument and a massaging assembly. 4,082,089, Cl. 128-24.300.
Moriyama, Toshiyuki: *See*—
Moriyama, Hisa; and Moriyama, Toshiyuki, 4,082,089, Cl. 128-24.300.
Morlan, Alva F. X-ray absorbing wedge for improving soft tissue outline. 4,082,957, Cl. 250-482.000.
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Morton, Douglas Ross, Jr., to Upjohn Company, The. 13,14-Dihydro-PGD_1, analogs. 4,082,782, Cl. 260-408.000.
Morton, Douglas Ross, Jr., to Upjohn Company, The. Cis-13-PGD_1 compounds. 4,082,784, Cl. 260-413.000.
Morton, Douglas Ross, Jr., to Upjohn Company, The. Inter-oxa-PGD_1 compounds. 4,082,794, Cl. 260-514.00D.
Morton, Edward W.; and Gilmore, John F., to Westinghouse Electric Corporation. Energy saving device for a standard fluorescent lamp system. 4,082,981, Cl. 315-97.000.
Mosher, Paul R., to United States of America, Navy. Solventless double base propellants and method for plasticizing MTN nitrocellulose propellants without use of solvents. 4,082,583, Cl. 149-96.000.
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Mossner, William Arno; and Mueller, Gerald Edwin, to Houdaille Industries, Inc. Floating tool holder. 4,082,472, Cl. 408-57.000.
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Mould, Henry Manifold, to Perkin-Elmer Limited. Optical slit control apparatus. 4,082,461, Cl. 356-100.000.
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Mossner, William Arno; and Mueller, Gerald Edwin, 4,082,472, Cl. 408-57.000.
Mueller, Karl, to Xerox Corporation. Method and apparatus for fuser assembly cooling in an electrostatographic machine. 4,082,137, Cl. 165-1.000.
Mueller, Otto, Jr., to Massey-Ferguson Inc. Hydraulic connection and method. 4,082,318, Cl. 285-19.000.
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Murphy, James R., to Pullman Incorporated. Process for separating solid asphaltic fraction from hydrocracked petroleum feedstock. 4,082,648, Cl. 208-97.000.
Murphy, Randal T.: *See*—
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Murrmann, Helmuth: *See*—
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Musbach, Alan Jon, to M.C.P. Industries, Inc. Method of electroplating small parts with chrome substitute tin alloys and electroplating barrel therefor. 4,082,623, Cl. 204-43.00S.
Myers, Mark Stanley; and Bowler, Richard George, to Metrosound Audio Products Ltd. Cleaning and static-removing device for gramophone records. 4,082,294, Cl. 274-47.000.
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Nagata, Akira; and Iyoda, Jun, to Agency of Industrial Science & Technology. Method for manufacture of non-coagulative organosilicone polymer. 4,082,727, Cl. 260-46.50G.
Nagel, Ronald P.: *See*—
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Nahle, Armando. Medicant composition for the treatment of diabetes. 4,082,842, Cl. 424-229.000.
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Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, to Bristol-Myers Company. Certain 7-acylamido-3-(2-carboxyalkyl-2,3-dihydro-s-triazolo[4,3-b]pyridazin-3-on-6-ylmethyl)-3-cephem-4-carboxylic acids their salts and easily hydrolyzed esters. 4,082,912, Cl. 544-26.000.
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Nakagawa, Koji; and Hirano, Kenkiti, to Denki Kagaku Kogyo Kabushiki Kaisha. Method for execution of quick hardening cement. 4,082,561, Cl. 106-89.000.
Nakagawa, Masataka; Iga, Tadasu; and Fukura, Akira, to Sumitomo Chemical Company, Limited. Process for the preparation of aromatic secondary or tertiary amino compounds. 4,082,802, Cl. 260-574.000.
Nakagawa, Mutsuaki: *See*—
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Yokota, Akira; and Nakagawa, Yasuhiko, 4,081,959, Cl. 60-282.000.
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Hayashi, Tadaaki; and Nakahara, Teruto, 4,082,434, Cl. 350-225.000.
Nakajima, Toshi; Sagara, Takao; and Hagio, Shohachiro, to Kubota, Ltd. Separation-preventing pipe joint construction. 4,082,321, Cl. 285-39.000.
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Nakamura, Naoji: *See*—
Masumoto, Hakaru; Murakami, Yuetsu; and Nakamura, Naoji, 4,082,579, Cl. 148-31.550.
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Nakashima, Noriyuki, to Nippondenso Co., Ltd. Liquid level detector. 4,082,959, Cl. 250-577.000.
Nakata, Roy; and Bohlinger, Arthur Leo, to General Electric Company. Stab connector for enclosed electric bus apparatus. 4,082,933, Cl. 200-163.000.
Nannelli, Piero L.; and Monsimer, Harold G., to United States of America, Navy. Aromatic phosphinic acids containing sulfone linkage. 4,082,793, Cl. 260-502.40R.
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Fries, William; and Napierski, Silvia, 4,082,564, Cl. 127-46.00A.
Fries, William; and Napierski, Silvia, 4,082,701, Cl. 260-2.10E.
Narasimhan, Mandayam J.: *See*—
Thirumalachar, Mandayam J.; Narasimhan, Mandayam J.; and Anderson, John A., 4,082,613, Cl. 195-76.000.
National Manufacturing, Co.: *See*—
Edeus, James A., 4,081,880, Cl. 16-90.000.
National Marineplastic Co., Ltd.: *See*—
Iida, Norihika; and Gobaru, Shigeto, 4,082,590, Cl. 156-144.000.
Natkins, Ephraim, to American Casting & Mfg. Corporation. Tamper proof seal. 4,082,336, Cl. 292-318.000.
NCR Corporation: *See*—
Egawa, Setsuya; Sakamoto, Masahiro; and Matsushita, Toshihiko, 4,082,688, Cl. 252-316.000.
Gottschlich, James A., 4,082,210, Cl. 226-91.000.
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Corbett, Roger Patrick; Gilson, Trevor Robert; Nealon, Terence Patrick; and Hendra, Patrick John, 4,082,860, Cl. 427-27.000.
Nelson, George Franklin: *See*—
Sauter, Gerald Francis; and Nelson, George Franklin, 4,082,424, Cl. 350-96.110.
Nelson, Norman A.: *See*—
Kelly, Robert C.; and Nelson, Norman A., 4,082,776, Cl. 260-343.600.
Nelson, William T.: *See*—
Holtz, Hans D.; Nelson, William T.; and Devault, Albert N., 4,082,518, Cl. 44-72.000.

Neotec Corporation: *See*—
Johnson, Robert Lincoln, Jr., 4,082,464, Cl. 356-188.000.
Nestor, John J., Jr.: *See*—
Jones, Gordon H.; Moffatt, John G.; and Nestor, John J., Jr., 4,082,735, Cl. 260-112.50R.
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Neumann, Arthur E.: *See*—
Rumer, David Orville, Jr.; Findlay, Donald James; Neumann, Arthur E.; and Del Castillo, Juan M., 4,082,029, Cl. 84-484.000.
Neumann, Jurgen: *See*—
Kluger, Wolfgang; and Neumann, Jurgen, 4,082,205, Cl. 222-193.000.
Neuss, Norbert: *See*—
Brannon, Donald R.; and Neuss, Norbert, 4,082,754, Cl. 260-287.00P.
New England Nuclear Corporation: *See*—
Adler, Norman; and Camin, Leopoldo Lazaro, 4,082,840, Cl. 424-1.000.
Newell, Alfred Turenne, III. Animal feeding apparatus. 4,082,064, Cl. 119-51.110.
Newhouse, Donn G.: *See*—
Zwiep, Theodore Carl; Newhouse, Donn G.; and Craner, Jerry D., 4,082,856, Cl. 426-299.000.
Newmark, Harold Leon: *See*—
McGregor, Weldon Courtney; Newmark, Harold Leon; and Ramel, Armin Hermann, 4,082,737, Cl. 260-112.50R.
Newsome, Mary H. Cigarette dispenser and lighter. 4,082,202, Cl. 221-147.000.
Newton, Robert E., to Auburn International, Inc. Vapor/liquid fraction determination. 4,082,994, Cl. 324-30.00R.
NGK Insulators, Ltd.: *See*—
Sato, Nobuo, 4,082,663, Cl. 210-79.000.
NGK Spark Plug Co., Ltd.: *See*—
Iijima, Sigeru, 4,082,826, Cl. 264-65.000.
Nicol, Henry A. Sailing cradle. 4,082,049, Cl. 114-39.000.
Niebylski, Leonard M.; and Rifkin, Ellis B., to Ethyl Corporation. Fuel composition for reducing exhaust gas catalyst plugging. 4,082,517, Cl. 44-68.000.
Niel, Pierre: *See*—
Rozier, Paul; Niel, Pierre; and Ferlay, Jean, 4,082,932, Cl. 200-148.00R.
Nielsen, Jorgen Ilum: *See*—
Borrevang, Poul; Guddal, Erling; Petersen, Henning Borge; Faarup, Peter; and Nielsen, Jorgen Ilum, 4,082,745, Cl. 260-239.100.
Nielsen, Ole Bent Tvaermose: *See*—
Feit, Peter Werner; Nielsen, Ole Bent Tvaermose; Bruun, Herta; and Bretting, Claus Aage Svensgaard, 4,082,851, Cl. 424-300.000.
Nihon Electronic Industry Co., Ltd.: *See*—
Kozima, Yasuhiro, 4,082,599, Cl. 156-504.000.
Nihon Iyakuhin Kogyo Co., Ltd.: *See*—
Ikeda, Masao; Miyamoto, Shigeo; Nozawa, Thutomu; Kurobe, Akira; and Futsukaichi, Osamu, 4,082,744, Cl. 260-239.0BB.
Nihon Radiator Co., Ltd. (Nihon Rajieeta Kabushiki Kaisha): *See*—
Miyake, Shiuichi; and Saito, Takao, 4,082,971, Cl. 310-114.000.
Nijman, John Peter, to Bunker Ramo Corporation. Planar pi multi-filter having a ferrite inductance for pin filters in electrical connectors. 4,083,022, Cl. 333-79.000.
Nikka Kabushiki Kaisha: *See*—
Ueno, Tadayoshi; and Itaya, Akio, 4,082,038, Cl. 101-425.000.
Nikonets, Leonid Alexeevich: *See*—
Burgsdorf, Vladimir Vladimirovich; Genrikh, Georgy Andreevich; Nikonets, Leonid Alexeevich; Mishin, Valery Vasilievich; Kuznetsov, Viktor Yakovlevich; and Kondratiev, Anatoly Dmitrievich, 4,082,962, Cl. 307-147.000.
Nilsson, Jan: *See*—
Gustafsson, Sven-Goran; Nilsson, Jan; and Syvakari, Pertti, 4,081,984, Cl. 72-60.000.
Nilsson, Karl Osten Alf; and Lindell, Curt Oskar, to Toolex Alpha AB. Adjustable apparatus for separating an outermost label from a stack of labels. 4,082,260, Cl. 271-1.000.
Nims, Philip A., to Crompton & Knowles Corporation. Pneumatic picking mechanism for looms. 4,082,118, Cl. 139-144.000.
Ninneman, Lawrence D.: *See*—
Guest, Paul Richard; and Ninneman, Lawrence D., 4,082,200, Cl. 215-1.00C.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Deutsch, Ralph, 4,082,028, Cl. 84-1.240.
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,082,027, Cl. 84-1.010.
Nippon Oil Co., Ltd.: *See*—
Nobuo, Yokoyama, 4,082,558, Cl. 106-10.000.
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Yoshida, Motoaki, 4,082,894, Cl. 428-335.000.
Nippon Steel Corporation: *See*—
Ando, Teiichi; and Itoi, Hidenobu, 4,082,718, Cl. 260-33.40R.
Sasaki, Minoru; Hida, Yukihiro; Enokido, Tsuneo; and Ito, Kaoru, 4,082,540, Cl. 75-3.000.
Sugawara, Kinichi, 4,082,539, Cl. 75-3.000.
Nippondenso Co., Ltd.: *See*—
Nakashima, Noriyuki, 4,082,959, Cl. 250-577.000.
Nishikawa, Yukiyasu; and Itagaki, Takuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure information quantizing circuit utilizing shift register. 4,083,055, Cl. 354-23.00D.
Nishimura, Sanji: *See*—
Watanabe, Morio; and Nishimura, Sanji, 4,082,832, Cl. 423-70.000.
Nishino, Eizo. Scale removal device. 4,081,875, Cl. 15-104.06R.
Nishiwaki, Kiyoshi: *See*—
Nakamura, Hiroyuki; Kawaguchi, Hiroshi; and Nishiwaki, Kiyoshi, 4,083,032, Cl. 340-71.000.
Nissan Motor Company, Limited: *See*—
Washino, Kozo, 4,082,119, Cl. 139-370.200.
Yokota, Akira; and Nakagawa, Yasuhiko, 4,081,959, Cl. 60-282.000.
Niswender, Gordon Dean; and Hudson, James M., to Rohm and Haas Company. Cyanocobalamin derivatives. 4,082,738, Cl. 260-121.000.
NM Uranium, Inc.: *See*—
Spence, Andrew P., 4,082,359, Cl. 299-4.000.
Noat, Jacques: *See*—
Vrancken, August; Dufour, Paul; Noat, Jacques; and Holderic, Jean, 4,082,710, Cl. 260-23.0TN.
Nobuo, Yokoyama, to Nippon Oil Co., Ltd. Novel polyolefin waxes and aqueous polishing emulsions thereof. 4,082,558, Cl. 106-10.000.
Noland, Richard D. Self-cleaning filter. 4,082,524, Cl. 55-294.000.
Nolte and Nolte, P.C.: *See*—
Williams, Jake Millard, 4,082,437, Cl. 352-123.000.
Nonaka, Yoshimasa: *See*—
Tanaka, Michiaki; and Nonaka, Yoshimasa, 4,082,397, Cl. 339-49.00R.
Nonn, Konrad; Wolf, Karlheinz; and Hornle, Reinold, to Bayer Aktiengesellschaft. Dyeing preparations, which are soluble in cold water, of anionic dyestuffs. 4,082,505, Cl. 8-85.00R.
Noone, Thomas M.: *See*—
Rudner, Bernard; and Noone, Thomas M., 4,082,704, Cl. 260-2.50A.
Noordermeer, Aart: *See*—
Kok, Johannes George Jacobus; van Moorselaar, Rudolf; and Noordermeer, Aart, 4,082,721, Cl. 260-42.210.
Notari, Bruno; and Rivola, Luigi, to Snamprogetti, S.p.A. Process for the production of aluminum chlorohydroxides. 4,082,685, Cl. 252-187.00R.
Notari, Bruno: *See*—
Fattore, Vittorio; and Notari, Bruno, 4,082,785, Cl. 260-465.300.
Novak, Emil J.: *See*—
Schneider, Manuel; and Novak, Emil J., 4,082,665, Cl. 210-91.000.
Novick, William J., Jr.: *See*—
Lassman, Howard B.; and Novick, William J., Jr., 4,082,850, Cl. 424-278.000.
Novo Industri A/S: *See*—
Borrevang, Poul; Guddal, Erling; Petersen, Henning Borge; Faarup, Peter; and Nielsen, Jorgen Ilum, 4,082,745, Cl. 260-239.100.
Nowack, Gerhard P.: *See*—
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 4,082,815, Cl. 260-683.200.
Nozawa, Takamitsu, to Yoshino Kogyosho Co., Ltd. Trigger type spraying device. 4,082,223, Cl. 239-333.000.
Nozawa, Thutomu: *See*—
Ikeda, Masao; Miyamoto, Shigeo; Nozawa, Thutomu; Kurobe, Akira; and Futsukaichi, Osamu, 4,082,744, Cl. 260-239.0BB.
O & K Orenstein & Koppel Aktiengesellschaft Werk Lubeck: *See*—
Timmann, Peter; and Steinborn, Heinrich A., 4,082,051, Cl. 114-72.000.
Oakes, Malcolm Campbell, to Taymar Limited. Gas appliance valve and adaptor. 4,082,993, Cl. 137-322.000.
Obermoller, Douglas B., to Raven Industries, Inc. All electrical self-contained fuel control system for a burner in a thermal airship. 4,082,239, Cl. 244-98.000.
Obrecht, Robert E. Connection arrangement for manifold blocks. 4,082,324, Cl. 285-137.00R.
O'Brien, John P. Golf training device. 4,081,918, Cl. 36-132.000.
O'Brien, Philip F.: *See*—
McColgan, John M.; and O'Brien, Philip F., 4,082,081, Cl. 126-271.000.
Occidental Oil Shale, Inc.: *See*—
Compton, Leslie E.; and Rowan, William H., 4,082,146, Cl. 166-259.000.
Elkington, W. Brice, 4,082,145, Cl. 166-251.000.
Occidental Petroleum Corporation: *See*—
Ore, Fernando, 4,082,836, Cl. 423-321.00S.
Offergeld, Egon; and Wischniewski, Martin, to Buttner-Schilde-Haas Aktiengesellschaft. System for drying and heating particulate coal. 4,082,498, Cl. 432-14.000.
Ogisu, Kenji: *See*—
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,082,628, Cl. 204-64.00T.
O'Grady, Thomas M.: *See*—
Wennerberg, Arnold N.; and O'Grady, Thomas M., 4,082,694, Cl. 252-444.000.
Ohta, Masafumi, to Ricoh Co., Ltd. Trinitro-11H-indeno[1,2-b]quinoxaline-11-one and process for preparing same. 4,082,750, Cl. 260-250.00Q.
Ohtsu, Takao; Nakamura, Yukinobu; and Sugimoto, Akira, to Japan Gasoline Co., Ltd. Oil detecting device. 4,082,997, Cl. 324-65.00R.
Ohuchi, Hirobumi; Kawakami, Sumio; and Okamura, Masahiro, to Hitachi, Ltd. Avalanche photodiode with reduced avalanche breakdown voltage. 4,083,062, Cl. 357-13.000.
Oil States Rubber Company: *See*—
von Base, Robert J., 4,082,468, Cl. 403-2.000.
Oka, Masahisa: *See*—
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, 4,082,912, Cl. 544-26.000.

Oka, Toshihiko: *See—*
Hasegawa, Katsumi; Nakanishi, Toru; and Oka, Toshihiko, 4,081,888, Cl. 28-285.000.

Okamura, Masahiro: *See—*
Ohuchi, Hirobumi; Kawakami, Sumio; and Okamura, Masahiro, 4,083,062, Cl. 357-13.000.

Okita, Koichi, to Sumitomo Electric Industries, Ltd. Porous polytetrafluoroethylene tubings and process of producing them. 4,082,893, Cl. 428-376.000.

Okladnikov, Vladlen Alexeevich: *See—*
Minin, Vladilen Fedorovich; Gambarov, Vitaly Stepanovich; Kachan, Mikhail Samuilovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; and Trishin, Jury Alexeevich, 4,081,982, Cl. 72-56.000.

Okuhara, Shinzi, to Hitachi, Ltd. Semiconductor speech path switch. 4,082,923, Cl. 179-18.0GF.

Okumura, Jun: *See—*
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O'Leary, Kevin P.: *See—*
Conder, Terrence M.; and O'Leary, Kevin P., 4,082,879, Cl. 428-219.000.

Olin Corporation: *See—*
Owens, William F., Jr., 4,082,098, Cl. 131-9.000.
Ralston, Richard W., Jr.; and Ames, George K., 4,082,639, Cl. 204-219.000.

O'Loughlin, James P.: *See—*
Hornbeck, Donald W.; and O'Loughlin, James P., 4,082,965, Cl. 307-260.000.

Olschewski, Armin: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; Schurger, Rainer; Brandenstein, Manfred; and Burkl, Erich, 4,082,374, Cl. 308-6.00C.

O'Neil, Charles P., to Amerace Corporation. Timing device with tripping mechanism for fluid valve. 4,082,113, Cl. 137-624.110.

Onizawa, Masao, to Sanyo Trading Co., Ltd. Vulcanizable rubber compositions and vulcanized rubbers obtained therefrom. 4,082,700, Cl. 260-2.00A.

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Saito, Masao; Onozawa, Mamoru; Sasagawa, Kaoru; and Kawakami, Takamasa, 4,082,786, Cl. 260-465.00C.

Ontario Energy Corporation: *See—*
Flynn, Peter Charles, 4,082,646, Cl. 208-11.00R.

Ore, Fernando, to Occidental Petroleum Corporation. Process for the purification of phosphoric acid by extraction. 4,082,836, Cl. 423-321.00S.

Ore-Ida Foods, Inc.: *See—*
Citti, James E.; and Dienst, Carl S., 4,082,855, Cl. 426-250.000.
Hodges, Joseph L.; and Green, Glen R., 4,082,024, Cl. 83-402.000.

Oride, Akiyoshi: *See—*
Yamada, Yukio; Abe, Michiharu; and Oride, Akiyoshi, 4,082,441, Cl. 355-14.000.

Oroshnik, William, to SCM Corporation. Intermediates for Vitamin A. 4,082,791, Cl. 560-260.000.

Orzalesi, Giovanni; and Selleri, Renato, to Societa Italo-Britannica L. Manetti-H. Roberts & Co. 2-(4-Isobutylphenyl)-propiohydroxamic acid and a procedure for its preparation. 4,082,707, Cl. 260-500.50H.

Osment, David L. Method of making model trees and article. 4,082,586, Cl. 156-61.000.

Oster Corporation: *See—*
Sukow, Daniel L.; Smith, Richard A.; and Cockroft, James B., 4,082,941, Cl. 219-243.000.

Otis Elevator Company: *See—*
Simon-Kochloffel, Arnulf Ivan, 4,082,173, Cl. 198-330.000.

Otoshi, Yutaka; and Ishino, Ken, to TDK Electronics Co., Ltd. Vessel for use in heating food. 4,082,560, Cl. 106-45.000.

Ott, Denis P.: *See—*
Sting, Donald W.; and Ott, Denis P., 4,082,327, Cl. 285-401.000.

Ouchi, Yoshio; and Ikeda, Takatoshi, to Hitachi, Ltd. Ink jet recording method and apparatus. 4,083,053, Cl. 346-75.000.

Ovshinsky, Stanford R.: *See—*
Izu, Masatsuga; and Ovshinsky, Stanford R., 4,082,861, Cl. 427-56.000.

Owen, William J., to Martin Marietta Corporation. Automatic space sextant. 4,082,462, Cl. 356-152.000.

Owens-Corning Fiberglas Corporation: *See—*
Symborski, Alex P., 4,082,469, Cl. 403-24.000.

Owens-Illinois, Inc.: *See—*
Guest, Paul Richard; and Ninneman, Lawrence D., 4,082,200, Cl. 215-1.00C.

Owens, William F., Jr., to Olin Corporation. Flavored cigarette. 4,082,098, Cl. 131-9.000.

Oxford Laboratories Inc.: *See—*
Sturm, Ronald Leo; and Smith, James Curtis, 4,082,121, Cl. 141-27.000.

P. Leiner & Sons Limited: *See—*
Croome, Ronald John, 4,082,857, Cl. 426-573.000.

Pacesetter Systems Inc.: *See—*
Mann, Alfred E.; and Schulman, Joseph H., 4,082,097, Cl. 128-419.0PS.

Packard, Douglas R.: *See—*
Grossman, Leonard N.; and Packard, Douglas R., 4,082,834, Cl. 423-210.000.

Pader, Morton, to Lever Brothers Company. Dentifrice. 4,082,841, Cl. 424-50.000.

Page, Dennis M.; and Bevilacqua, Albert J., to M I Systems, Inc. ECG monitoring pad. 4,082,086, Cl. 128-2.06E.

Paget, Charles J.; and Wikel, James H., to Eli Lilly and Company. 4-(2-Halophenyl)-1,2,4-triazole-3-thiol compounds. 4,082,762, Cl. 260-308.00R.

Paice, Derek A., to Westinghouse Electric Corporation. Measurement of motor winding temperature. 4,083,001, Cl. 324-158.0MG.

Pako Corporaton: *See—*
Jensen, Gerald A.; Harvey, Ronald B.; Caulfield, Patrick J.; Putzke, Dwayne H.; and Strunc, Gerald R., 4,082,943, Cl. 235-303.100.

Pallemaerts, Colin J.: *See—*
Bickford, William J.; Hatton, William L.; Pallemaerts, Colin J.; Tanzi, Paul J.; and Tsao, Carson K. H., 4,083,009, Cl. 325-304.000.

Palmer, Wayne D. Security apparatus. 4,082,332, Cl. 292-259.00R.

Palosi, Eva: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,082,813, Cl. 260-618.00B.

Palumbo, Dominic T., deceased (by Palumbo, Frances A., administratrix); and Shaffer, Francis N., to GTE Sylvania Incorporated. Manganese activated alkaline earth tungstate phosphors and method of preparing the same. 4,082,687, Cl. 252-301.40F.

Palumbo, Frances A., administratrix: *See—*
Palumbo, Dominic T., deceased; and Shaffer, Francis N., 4,082,687, Cl. 252-301.40F.

Papirer, Eugene; and Donnet, Jean-Baptiste, to Agence Nationale de Valorisation de la Recherche. Method of purification. 4,082,660, Cl. 210-36.000.

Paramonov, Evgeny Borisovich: *See—*
Zakharov, Nikolai Nikolaevich; and Paramonov, Evgeny Borisovich, 4,081,955, Cl. 60-39.16S.

Parker, Ernest G.: *See—*
Milner, Edward F. G.; Parker, Ernest G.; and Swinkels, Godefridus M., 4,082,629, Cl. 204-66.000.

Parker-Hannifin Corporation: *See—*
Hoffman, Robert K.; and Franson, David C., 4,082,107, Cl. 137-195.000.

Parker, Walter, to Ernest Scragg & Sons Limited. Manufacture of bulked yarn. 4,081,948, Cl. 57-34.0HS.

Parkinson, Ronald; and Sinton, Richard Allan, to Falconbridge Nickel Mines Limited. Reusable integrated cathode unit. 4,082,641, Cl. 204-281.000.

Parmentier, Jean; Saurais, Jacques; and Carre, Gerard, to SKF Compagnie d'Applications Mecaniques. Ball cages for ball bearings of the angular contact type having a double row of balls with opposed angular contacts. 4,082,383, Cl. 308-194.000.

Parrow, Harold: *See—*
McCartney, Clyde B., 4,082,155, Cl. 180-5.00R.

Parrow, Wayne: *See—*
McCartney, Clyde B., 4,082,155, Cl. 180-5.00R.

Partyka, Richard Anthony: *See—*
Juby, Peter Frederick; and Partyka, Richard Anthony, 4,082,751, Cl. 260-256.40C.

Pascuzzi, Louis Ferdinand, to Cineffects Color Laboratory Inc. Wet gate embodied in a photographic strip film printer. 4,082,447, Cl. 355-30.000.

Pasero, Edoardo: *See—*
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Regreny, Andre Maurice; Passaret, Michel Xavier; and Rivoallan, Loic Andre, 4,082,601, Cl. 156-623.00R.

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Lake, Peter B.; Grenawalt, John J.; and Pastorek, Ronald L., 4,082,576, Cl. 148-12.00F.

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Patel, Vinod, to Xerox Corporation. Compact illumination system for optically providing a structured photoreceptor charge distribution. 4,082,451, Cl. 355-71.000.

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Larsen, Larry D., 4,083,037, Cl. 340-237.00S.

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Headrick, J. Charles; Starnes, R. Emory; and Peel, Robert C., 4,082,212, Cl. 228-147.000.
Peeples, Denny L., to General Motors Corporation. Liquid level sensor. 4,082,930, Cl. 200-84.00C.
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Austin, Robert R.; and Bastien, Roy C., 4,082,413, Cl. 350-1.100.
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Mould, Henry Manifold, 4,082,461, Cl. 356-100.000.
Perreault, Jules; and Bombardier, Emile, to Bombardier Limited. Vehicle windshield. 4,082,346, Cl. 296-84.00R.
Perretta, Michael L., to Crouse-Hinds Company. Ballast vibration isolation system with thermal path. 4,082,141, Cl. 165-69.000.
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Perry, Jack A. Spring type ball-pitching apparatus. 4,082,076, Cl. 124-7.000.
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Pfarrer, David M., to Lennox Industries, Inc. Switching contactor circuit for five-lead two-speed single-phase motor. 4,082,989, Cl. 318-224A.
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Pharo, Lawrence C., Jr., to United States of America, Navy. Acoustic presence detection method and apparatus. 4,083,031, Cl. 340-5.00R.
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Mitacek, Bill, 4,082,680, Cl. 252-59.000.
Piber, Earl T., to Cutler-Hammer, Inc. Switch with illuminated handle tip. 4,082,934, Cl. 200-315.000.
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Schubert, Keith E., 4,082,006, Cl. 74-89.200.
Pittinger, A. Lincoln. Energy roof. 4,082,080, Cl. 126-271.000.
Pizzio, Pietro, to Alfachimici S.p.A. Silver base activating solutions for electroless copper deposition. 4,082,557, Cl. 106-1.110.
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Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Hydrocracking hydrocarbons over tri-metallic catalyst. 4,082,649, Cl. 208-111.000.
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Pommer, Dennis, to General Mills, Inc. Apparatus for handling snack chips. 4,082,176, Cl. 198-411.000.
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Poot, Albert Lucien: *See—*
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Popodi, Alfred E., to Westinghouse Electric Corporation. Fast switching phase lock loop system. 4,083,015, Cl. 331-4.000.
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Girardin, Jean-Claude, 4,082,970, Cl. 310-113.000.
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Portnoy, Norman A.; and Anderson, David Paul, to International Telephone and Telegraph Corporation. Recovery of chemical components of cellulosic regenerating solution. 4,082,617, Cl. 203-28.000.
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PPG Industries, Inc.: *See—*
Chang, Wen-Hsuan, 4,082,634, Cl. 204-159.150.
Estes, Ronald L.; McGee, Larry S.; and Welton, Sanford M., 4,082,526, Cl. 65-24.000.
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Kelly, Joseph B., 4,081,927, Cl. 51-101.00R.
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Miller, Richard G.; and Cavitt, Roy L., 4,082,898, Cl. 428-427.000.
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Pracht, Hans Joachim; and Wong, Louis Fay, to Procter & Gamble Company, The. Fabric conditioning articles and process. 4,082,678, Cl. 252-8.600.

Pressman, Gerald L., to ElectroPrint. Electrostatic modulator for control of flow of charged particles. 4,082,448, Cl. 355-3.0SC.

Prestele, Karl: *See—*
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Pricon, Inc.: *See—*
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Prince, Jack E.; Terry, Franklin E.; and Mullins, William H. Liquid Waste treatment apparatus. 4,082,662, Cl. 210-63.00R.

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Propper Manufacturing Co., Inc.: *See—*
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Prototech Company: *See—*
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Provi, Mike A., to Brearley Company, The. Digital type floor scale with weigh cycle control. 4,082,153, Cl. 177-177.000.

Pruncutz, T. John. Fish hook holder. 4,081,923, Cl. 43-57.50R.

Pugh, Brinley Roy, to Lever Brothers Company. Toothbrushes. 4,081,876, Cl. 15-167.00R.

Pullman Incorporated: *See—*
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Putnam, Dean H., to Magnagard Equipment & Manufacturing Corporation. Modular microfiche duplicator. 4,082,454, Cl. 355-99.000.

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Raabe, Ralph C.; Cleffman, Roger G.; and Stratton, Raymond G., to Bandag Incorporated. Splicing of tread strips. 4,082,592, Cl. 156-153.000.

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Ralston, Richard W., Jr.; and Ames, George K., to Olin Corporation. Method and apparatus for mercury cell anode adjustment. 4,082,639, Cl. 204-219.000.

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Rangi, Rajindar S.; and South, Peter, to Canadian Patents and Development Limited. Overspeed spoilers for vertical axis wind turbine. 4,082,479, Cl. 416-23.000.

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Robinson, Delmar W., to UOP Inc. Method of catalyst manufacture. 4,082,696, Cl. 252-466.00B.
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Rodemeyer, Donald J., to Metaframe Corporation. Integrated aquarium. 4,082,062, Cl. 119-5.000.
Rodgers, John, to Raymond Lee Organization, Inc., The. Portable solar oven and grill. 4,082,079, Cl. 126-270.000.
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McRae, Dougal Harold, 4,082,538, Cl. 71-125.000.
Niswender, Gordon Dean; and Hudson, James M., 4,082,738, Cl. 260-121.000.
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Rossi, Eugene F., to Allis-Chalmers Corporation. Multipurpose kiln shell gas burner. 4,082,499, Cl. 432-19.000.
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Buchan, William A.; and Rotter, Gerhard, 4,082,237, Cl. 242-192.000.
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Rowan, William H.: *See—*
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Kulp, Jack H.; and Florsheim, James M., 4,083,033, Cl. 340-114.00R.
Rozier, Paul; Niel, Pierre; and Ferlay, Jean, to Delle-Alsthom S.A. High-voltage electric equipment cell. 4,082,932, Cl. 200-148.00R.
RTE Corporation: *See—*
Flatt, Richard P., 4,082,404, Cl. 339-111.000.
Link, Edwin A., 4,082,866, Cl. 427-294.000.
Rubright, Phillip L., to Chemcast Corporation. Sealing member. 4,081,879, Cl. 16-2.000.
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Rumer, David Orville, Jr.; Findlay, Donald James; Neumann, Arthur E.; and Del Castillo, Juan M., to Del Castillo, Juan M. Optical metronomes. 4,082,029, Cl. 84-484.000.
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Saari, Walfred S.; and Lumma, William C., Jr., to Merck & Co., Inc. 3-(1-Piperazinyl)-pyrido[2,3-b]pyrazines. 4,082,845, Cl. 424-250.000.
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Sackin, Milton; and Hummert, George T., to Westinghouse Electric Corporation. Elevator system. 4,082,164, Cl. 187-29.00R.
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Nakajima, Toshi; Sagara, Takao; and Hagio, Shohachiro, 4,082,321, Cl. 285-39.000.
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Hutchings, Le Roi E.; and Sahlin, Thomas E., 4,082,647, Cl. 208-78.000.
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Takamasa, to Mitsubishi Gas Chemical Company, Inc. Process of production of aromatic nitriles. 4,082,786, Cl. 260-465.00C.

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Komuro, Takeo; Saito, Yukio; and Hirato, Mizuno, 4,082,615, Cl. 201-12.000.

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Salinger, Fred G., to Electro-Therm, Inc. Mounting grommet for an electric heating element used in appliances and the like. 4,082,301, Cl. 277-212.00F.

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Duff, Clifford C.; and Salloum, Robert J., 4,082,366, Cl. 302-11.000.

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Amin, Rajnikant B.; Anderson, Harlan Urie; and Hodgkins, Charles E., 4,082,906, Cl. 428-539.000.

Sanders, Davis J. Golf ball holder. 4,082,209, Cl. 224-29.00B.

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Bolton, Ivan Joseph; and Mercer, Alec Victor, 4,082,746, Cl. 260-239.900.

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Bourdon, Normand C.; Sanford, Richard; and Eifler, Raymond J., 4,082,398, Cl. 339-59.00M.

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Metcalf, Wilbur F., 4,083,052, Cl. 346-18.000.

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Santiago, Gonzalo D.: *See*—
Crawford, Duncan J.; and Santiago, Gonzalo D., 4,082,497, Cl. 431-158.000.

Santos, Adelino Claudio. Ejector retraction mechanism. 4,082,245, Cl. 249-68.000.

Santos, James P. Stationary exercise bicycle. 4,082,264, Cl. 272-73.000.

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Sasaki, Minoru; Hida, Yukihiro; Enokido, Tsuneo; and Ito, Kaoru, to Nippon Steel Corporation. Material for sintering emitting a lesser amount of nitrogen oxide and a method for manufacturing the same. 4,082,540, Cl. 75-3.000.

Sato, Hiroshi: *See*—
Shimogori, Kazutoshi; Sato, Hiroshi; and Tomari, Haruo, 4,082,900, Cl. 428-469.000.

Sato, Nobuo, to NGK Insulators, Ltd. Method of positioning a filter cake discharge device for a filter press. 4,082,663, Cl. 210-79.000.

Satriana, Daniel R.; and Bracuti, Arthur J., to United States of America, Army. Ballistic modifier. 4,082,584, Cl. 149-109.400.

Satzinger, Gerhard: *See*—
Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, 4,082,770, Cl. 260-330.500.

Saufferer, Helmut; and Willmann, Karl, to Daimler-Benz Aktiengesellschaft. Installation for feeding and atomizing liquid, especially combustion fuel. 4,082,070, Cl. 123-119.00E.

Saunders, Lawrence Allan, to Clark Equipment Company. Axle cradle mounting having elastomeric spherical bushings. 4,082,377, Cl. 308-15.000.

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Parmentier, Jean; Saurais, Jacques; and Carre, Gerard, 4,082,383, Cl. 308-194.000.

Sauter, Gerald Francis; and Nelson, George Franklin, to Sperry Rand Corporation. Integrated optic device. 4,082,424, Cl. 350-96.110.

Savage, Marc. Container-dispenser for desiccant material for inclusion in a racket handle. 4,082,204, Cl. 222-191.000.

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Yoshikawa, Masazi; and Sawada, Tomoe, 4,082,980, Cl. 315-59.000.

Sawaki, Toru: *See*—
Ichikawa, Yataro; Sawaki, Toru; and Honda, Yuitsu, 4,082,804, Cl. 260-584.00R.

Sawyer, Philip N. Prosthesis and method for making the same. 4,082,507, Cl. 8-94.110.

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Ferrell, Sherwood W.; Mann, Friedrich H.; and Schaefer, Henry A., 4,083,011, Cl. 325-352.000.

Schaefer, Robert H.; and McQuinn, Ted M., to General Motors Corporation. Transmission and control with centrifugal dump valve. 4,082,012, Cl. 74-864.000.

Schafer, Eugene D.: *See*—
Draugelis, Vaidevutis C.; and Schafer, Eugene D., 4,082,443, Cl. 355-4.000.

Schalow, Rudolph D., to Energystics. Vehicle guidance system. 4,083,047, Cl. 343-7.0VM.

Schardein, Daniel Joseph; and Lloyd, Ruth Diane, to Reynolds Metals Company. Thin molybdenum coatings on aluminum for solar energy absorption. 4,082,907, Cl. 428-640.000.

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Wittenbrook, Lawrence S.; and Scheiderer, Edwin L., 4,082,533, Cl. 71-28.000.

Scheller, James I. Tire tread structure. 4,082,131, Cl. 152-210.000.

Schelp, Helmut R., to Garrett Corporation, The. Low nitric oxide emission combustion system for gas turbines. 4,081,958, Cl. 60-39.51R.

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Vorbruggen, Helmut, 4,082,911, Cl. 536-23.000.

Schevey, William R.: *See*—
Spiliotis, Nicholas J.; Schevey, William R.; and Himler, Donald W., 4,082,621, Cl. 204-38.00B.

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Kleen, Gerhard; Schiemann, Heinz; and Allmendinger, Karl, 4,083,026, Cl. 336-70.000.

Schiethart, Lodewijk, to Heemaf B.V. Synchronous electric motor. 4,082,973, Cl. 310-162.000.

Schilling, Hermann; and Seifert, Heinz, to Carl Freudenberg, Firma. Silencer for exhausting gas streams. 4,082,160, Cl. 181-258.000.

Schilt, Earl A.: *See*—
Houston, James E.; Gingrich, Reynard W.; and Schilt, Earl A., 4,082,606, Cl. 159-27.00B.

Schjeldahl, Gilmore T. Apparatus for handling superimposed stacked receptacles. 4,082,203, Cl. 221-211.000.

Schlaf, Helmut: *See*—
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Buechner, Oskar; Schlichthaerle, Gottfried; and Urban, Friedrich, 4,082,910, Cl. 528-481.000.

Schlict, Larry J.: *See*—
Anderson, Clifton W.; Kubik, John J.; Pollock, Tom G.; Schlict, Larry J.; and Wilcox, Craig R., 4,082,198, Cl. 214-519.000.

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Zardi, Umberto; Lagana', Vincenzo; Bonetti, Andrea; and Schmid, Giorgio, 4,082,797, Cl. 260-555.00A.

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Jennings, Marvin D.; and Schmidgall, Rolf E., 4,081,996, Cl. 73-141.00A.

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Schmidt, George A.; Zubko, Ronald L.; and Abolins, Andrew, to Strick Corporation. Convertible vehicle body. 4,082,357, Cl. 298-27.000.

Schmidt, Manfred, to AGFA-Gevaert, A.G. Hose coupling. 4,082,112, Cl. 137-614.030.

Schmidt, Otto H.: *See*—
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Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer. Pre-mixed dental composition for the preparation of a dental silicate cement. 4,082,722, Cl. 260-42.430.

Schmitz, Joseph Francis, to Whirlpool Corporation. Vacuum cleaner fan. 4,082,478, Cl. 415-209.000.

Schnedler, Paul E.; Pierson, Marvin B.; Graff, Hart F.; Compton, Thomas A.; and Leasure, William R., to Armco Steel Corporation. Method for continuously contact-coating one side only of a ferrous base metal strip with a molten coating metal. 4,082,868, Cl. 427-329.000.

Schneider, Manuel; and Novak, Emil J. Fluid filter device for automotive power steering system. 4,082,665, Cl. 210-91.000.

Schoerner, Roger J.; and Chia, Enrique C., to Southwire Company. High tensile strength aluminum alloy conductor and method of manufacture. 4,082,573, Cl. 148-2.000.

Schouwenaars, Jozef E. K. M., to U.S. Philips Corporation. Phonograph record player or changer. 4,082,293, Cl. 274-39.00A.

Schroter, Herbert, to Hoechst Aktiengesellschaft. Device for adjusting an original to be copied. 4,082,456, Cl. 355-109.000.

Schubert, Keith E., to Pitney-Bowes, Inc. Postage meter conversion apparatus. 4,082,006, Cl. 74-89.200.

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Mann, Alfred E.; and Schulman, Joseph H., 4,082,097, Cl. 128-419.0PS.

Schulthess, Peter U.; and Wild, Peter J., to BBC Aktiengesellschaft

Brown, Boveri & Company, Ltd. Driving circuit for a matrix-addressed liquid crystal display device. 4,082,430, Cl. 350-333.000.

Schultz, Frederick K., to General Motors Corporation. Monostable multivibrator timer circuits with reset. 4,083,013, Cl. 328-207.000.

Schurger, Rainer: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; Schurger, Rainer; Brandenstein, Manfred; and Burkl, Erich, 4,082,374, Cl. 308-6.00C.

Schutt, Elmer F.; Thornton, Bryce G.; and Bentivegna, Charles R., Jr., to Addressograph Multigraph Corporation. Duplicator control by area scanned coded master. 4,082,039, Cl. 101-450.000.

Schwarz, Peter. Color television, having superimposed colors. 4,082,978, Cl. 313-474.000.

Schweiger, Barry: *See—*
Simon, Theodore, 4,083,039, Cl. 340-248.00R.

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SCM Corporation: *See—*
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Scott, Bruce Albert: *See—*
Engler, Edward Martin; Kaufman, Frank Benjamin; and Scott, Bruce Albert, 4,082,552, Cl. 96-38.400.

Scott USA, Inc.: *See—*
Liman, Sandy, 4,081,864, Cl. 2-161.00A.

Sedlmair, Gerhard, to Marker, Hannes. Front jaw for safety ski bindings. 4,082,314, Cl. 280-625.000.

Segal, Bernard C. Combination of interlocking security on chain door. 4,082,333, Cl. 292-264.000.

Seidel, William H.; and McDaniel, Ralph B., to N.O.V.A. Corporation. Tape cleaning device. 4,081,878, Cl. 15-256.500.

Seifert, Heinz: *See—*
Schilling, Hermann; and Seifert, Heinz, 4,082,160, Cl. 181-258.000.

Seiler, William, Jr., to David Kopf Systems. Proportioning system. 4,082,667, Cl. 210-96.00M.

Seipos, Andrew G.: *See—*
Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; Seipos, Andrew G.; and Castillo, Adolfo, 4,081,893, Cl. 29-432.000.

Seitz, Karl, to Ciba-Geigy AG. Fibre-reactive dyestuff containing a bis-triazinylamino. 4,082,739, Cl. 260-146.00T.

Seitz, Paul N., to Quantor Corporation. Film duplicator. 4,082,439, Cl. 355-100.000.

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Misiano, Carlo; Diedrich, Karl Heinz; and Simonetti, Enrico, 4,082,637, Cl. 204-192.00E.

Sell, Leslie James, to Picker Corporation. X-ray apparatus. 4,082,955, Cl. 250-445.00T.

Selleri, Renato: *See—*
Orzalesi, Giovanni; and Selleri, Renato, 4,082,707, Cl. 260-500.50H.

Semicon, Inc.: *See—*
House, Robert E.; Irvin, Robert A.; and Kane, Daniel F., 4,082,570, Cl. 136-89.0SJ.

Separex SA: *See—*
Westberg, Johan Eric Hayden, 4,082,217, Cl. 233-25.000.

Serbert Industries (Proprietary) Limited: *See—*
Alberts, Heinrich-Albert, 4,082,470, Cl. 403-172.000.

Sereda, Peter J.: *See—*
Litvan, Gerhard G.; and Sereda, Peter J., 4,082,562, Cl. 106-97.000.

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Anderton, William Arthur; and Sewell, Richard Benjamin Hollis, 4,082,588, Cl. 156-71.000.

Seymour, Samuel L., to PPG Industries, Inc. Press bending apparatus and method of fabrication. 4,082,530, Cl. 65-273.000.

Shabel, Barrie S.: *See—*
Evancho, Joseph W.; Shabel, Barrie S.; and Truckner, William G., 4,082,578, Cl. 148-12.70A.

Shadle, Robert James, to W. R. Grace & Co. Unoriented composite laminar film with an elastomeric layer and sealable layer. 4,082,877, Cl. 428-35.000.

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Palumbo, Dominic T., deceased; and Shaffer, Francis N., 4,082,687, Cl. 252-301.40F.

Shaffer, John W., to GTE Sylvania Incorporated. Photoflash lamp. 4,082,494, Cl. 431-95.00R.

Shank, Lee R. Method of making a textile product. 4,081,885, Cl. 28-149.000.

Sharp Kabushiki Kaisha: *See—*
Takagi, Toshinori, 4,082,636, Cl. 204-192.00N.

Shaw, Wilfrid G.; and Terrill, David B., to Standard Oil Company, The. Catalyst compositions especially useful for preparation of unsaturated acids. 4,082,698, Cl. 252-469.000.

Sheehan, Russell T. Self-contained pallet-elevating bag palletizer. 4,082,194, Cl. 214-6.00P.

Sheldon, Gregg. Torsion bar skateboard. 4,082,306, Cl. 280-87.04A.

Shell Oil Company: *See—*
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Shergov, Igor Vladimirovich; Slavinsky, Vladimir Danilovich; Fridlender, Lev Moiseevich; Zharinov, Valery Ivanovich; and Kozhaev, Arkady Filippovich. Thermionic heater cathode assembly of electron-beam gun. 4,082,938, Cl. 219-121.0EB.

Shibata, Tatsuo: *See—*
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Shichida, Hiromichi; Toyoda, Kenichi; and Nakano, Jiro, to Fujitsu Fanuc Limited. Tool-indexing apparatus for machine tool. 4,082,019, Cl. 82-36.00A.

Shier, George D., to Dow Chemical Company, The. Process for production of oxazine diones. 4,082,748, Cl. 544-98.000.

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Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, to Sumitomo Electric Industries, Ltd. An optical transmission fiber containing fluorine. 4,082,420, Cl. 350-96.310.

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Knabusch, Edward M.; and Shoemaker, Edwin J., 4,082,355, Cl. 297-440.000.

Shook, Howard Everett, Jr., to Du Pont de Nemours, E. I., and Company. Recovery of metal and triarylborane catalyst components from olefin hydrocyanation residue. 4,082,811, Cl. 260-606.50B.

Shrum, Lorne Russell. Molds for the continuous casting of metals. 4,081,983, Cl. 72-56.000.

Siemens Aktiengesellschaft: *See—*
Auracher, Franz; Mitterhummer, Gerhard; and Zeitler, Karl-Heinz, 4,082,421, Cl. 350-96.220.
Franetzki, Manfred; Korn, Volker; and Prestele, Karl, 4,082,088, Cl. 128-2.080.
Franke, Kurt, 4,082,954, Cl. 250-421.000.
Gies, Johannes, 4,082,964, Cl. 307-259.000.
Graul, Juergen; and Murrmann, Helmuth, 4,082,571, Cl. 148-1.500.
Hoffmann, Kurt, 4,082,963, Cl. 307-221.00D.
Krause, Hartmut; and Grassme, Ulrich, 4,082,953, Cl. 250-413.000.

Siess, Hans Gunter Gerhard: *See—*
Braun, Klaus Joachim; and Siess, Hans Gunter Gerhard, 4,082,460, Cl. 356-85.000.

Sigler, Thelma G., to Alpha Nova Development Corporation. Cast cutter. 4,081,906, Cl. 30-276.000.

Sigmatex AG Basel: *See—*
Weman, Per-Olof, 4,082,317, Cl. 280-745.000.

Silver, Harry. Electrical junction box. 4,082,915, Cl. 174-51.000.

Simeola, Mario J. Portable shampoo unit. 4,081,867, Cl. 4-159.000.

Simmons, Frank B.; Bozsvai, Alex; Kovacs, Louis A.; and Gerbetz, Robert P., to Reliance Electric Company. Lubricated bearing assembly. 4,082,381, Cl. 308-187.000.

Simon-Kochloffel, Arnulf Ivan, to Otis Elevator Company. Drive unit for an endless conveyor. 4,082,173, Cl. 198-330.000.

Simon, Stefan: *See—*
Johst, Wolfgang; Friese, Axel; and Simon, Stefan, 4,081,884, Cl. 28-119.000.

Simon, Theodore, to Simon, Theodore; and Schweiger, Barry. Voltage enhancement circuit for central station monitored alarm systems. 4,083,039, Cl. 340-248.00R.

Simonetti, Enrico: *See—*
Misiano, Carlo; Diedrich, Karl Heinz; and Simonetti, Enrico, 4,082,637, Cl. 204-192.00E.

Simulation Physics, Inc.: *See—*
Kirkpatrick, Allen R., 4,082,958, Cl. 250-492.00B.

Singer Company, The: *See—*
Jaffe, Wolfgang; and Lukawich, Joseph James, 4,081,974, Cl. 66-75.200.
Stiles, John Callender; and Ferriss, Lincoln Stark, 4,082,990, Cl. 318-662.000.

Single Buoy Moorings, Inc.: *See—*
van Heijst, Willem Jan, 4,082,050, Cl. 114-53.000.

Sinton, Richard Allan: *See—*
Parkinson, Ronald; and Sinton, Richard Allan, 4,082,641, Cl. 204-281.000.

Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, to Warner-Lambert Company. Amides of 4-hydroxy-6H-thieno[2,3-b]thiopyran-5-carboxylic acid-7,7-dioxide. 4,082,757, Cl. 260-294.80C.

Sjolander, Rino. Method and apparatus for the removal of deposits from a fuel injection valve. 4,082,565, Cl. 134-1.000.

Sjostrand, Uno Roland, to AB Ziristor. Arrangement for the reading of photocell markings on a material web provided with decoration. 4,081,944, Cl. 53-51.000.

Skalka, Paul: *See—*
Dobrosielski, Stephen S.; Richards, Edward L.; and Skalka, Paul, 4,083,027, Cl. 337-66.000.

SKF Compagnie d'Applications Mecaniques: *See—*
Parmentier, Jean; Saurais, Jacques; and Carre, Gerard, 4,082,383, Cl. 308-194.000.

SKF Industrial Trading & Development Company B.V.: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; Schurger, Rainer; Brandenstein, Manfred; and Burkl, Erich, 4,082,374, Cl. 308-6.00C.

Skurkiss, Peter Kenny, to Bell Telephone Laboratories, Incorporated. Process for chromating metallic surfaces. 4,082,620, Cl. 204-15.000.

Slater, John W. Pressure sensitive label applicator. 4,082,595, Cl. 156-351.000.

Slater, Robert Antony: *See—*
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, 4,082,843, Cl. 424-250.000.

Slavinsky, Vladimir Danilovich: *See—*
Shergov, Igor Vladimirovich; Slavinsky, Vladimir Danilovich; Fridlender, Lev Moiseevich; Zharinov, Valery Ivanovich; and Kozhaev, Arkady Filippovich, 4,082,938, Cl. 219-121.0EB.

Sly, William Porter; and Ringel, Reginald Karl, to Caterpillar Tractor Co. Sealing means and assembly therefore. 4,082,299, Cl. 277-82.000.

Smith, Donald H.: *See—*
Patterson, Thomas K.; Mitchell, William O.; Smith, Donald H.; and Hunter, John P., Jr., 4,082,589, Cl. 156-98.000.
Smith, Dudley C.: *See—*
Blackburn, James R.; Smith, Dudley C.; Smith, Theo B., Jr.; and Morgan, Jerry N., 4,082,142, Cl. 165-76.000.
Smith, Frank A.: *See—*
Augustine, Harry G.; Krupinski, Kenneth C.; and Smith, Frank A., 4,082,823, Cl. 264-7.000.
Smith, Homer H. Portable door securing device. 4,082,335, Cl. 292-291.000.
Smith, Hoyt L., to Cutters Machine Company, Inc. Drive speed control apparatus for cloth spreading machine. 4,082,258, Cl. 270-31.000.
Smith International, Inc.: *See—*
Kellner, Jackson M., 4,082,373, Cl. 308-4.00A.
Wood, Edgar Wray; and Young, Jerry Olympus, 4,082,323, Cl. 285-133.00A.
Smith, James B. Omnidirectional sewer hose support. 4,082,242, Cl. 248-83.000.
Smith, James Curtis: *See—*
Sturm, Ronald Leo; and Smith, James Curtis, 4,082,121, Cl. 141-27.000.
Smith Kline & French Laboratories Limited: *See—*
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, 4,082,843, Cl. 424-250.000.
Smith, Richard A.: *See—*
Sukow, Daniel L.; Smith, Richard A.; and Cockroft, James B., 4,082,941, Cl. 219-243.000.
Smith, Theo B., Jr.: *See—*
Blackburn, James R.; Smith, Dudley C.; Smith, Theo B., Jr.; and Morgan, Jerry N., 4,082,142, Cl. 165-76.000.
Smorzaniuk, Adam; and Lindlau, Paul F., to Amerace Corporation. Terminal block with encapsulated heat sink. 4,082,407, Cl. 339-112.00R.
Snamprogetti, S.p.A.: *See—*
Fattore, Vittorio; and Notari, Bruno, 4,082,785, Cl. 260-465.300.
Germano, Giovanni; Losciale, Francesco; Falesiedi, Roberto; Daclon, Ferruccio; and Merzagora, Nicola, 4,081,895, Cl. 29-573.000.
Notari, Bruno; and Rivola, Luigi, 4,082,685, Cl. 252-187.00R.
Zardi, Umberto; Lagana', Vincenzo; Bonetti, Andrea; and Schmid, Giorgio, 4,082,797, Cl. 260-555.00A.
Sneer, Meer. Dental implants. 4,081.908, Cl. 32-10.00A.
Snyder, Milo S.: *See—*
Dehait, Jack T.; Dietz, David C.; Snyder, Milo S.; and Talor, Francis M., 4,082,463, Cl. 356-167.000.
Snyder, Robert, to Documation, Inc. Band timing generator. 4,082,944, Cl. 235-309.000.
Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Lo Scalzo, Enzo; Ferre, Franco; and Cantoni, Gianfranco, 4,082,714, Cl. 260-29.70R.
Societa Italo-Britannica L. Manetti-H. Roberts & Co.: *See—*
Orzalesi, Giovanni; and Selleri, Renato, 4,082,707, Cl. 260-500.50H.
Societe Anonyme Automobiles Citroen: *See—*
Cadiou, Jean, 4,082,987, Cl. 318-139.000.
Societe Chimique des Charbonnages: *See—*
Couderc, Pierre; and Hilmoine, Serge, 4,082,775, Cl. 260-343.600.
Sodaflo Drinks Limited: *See—*
Haythornthwaite, Peter F.; and Relf, Victor K., 4,082,123, Cl. 141-64.000.
Sofec, Inc.: *See—*
Pedersen, Kristen I.; and Kiely, William L., 4,081,872, Cl. 9-8.00P.
Sogo, Yoshiaki: *See—*
Aoki, Sethuo; and Sogo, Yoshiaki, 4,082,936, Cl. 219-10.410.
Solex Research Corporation: *See—*
Watanabe, Morio; and Nishimura, Sanji, 4,082,832, Cl. 423-70.000.
Solid State Scientific Inc.: *See—*
Goldberg, Mitchell J., 4,083,020, Cl. 331-113.00R.
Sommer, Manfred, to Wolf, Helmut. Rotary vane-type pump. 4,082,485, Cl. 418-226.000.
Sony Corporation: *See—*
Hamada, Takeshi; Ishigaki, Yoshio; and Hongu, Masayuki, 4,083,019, Cl. 331-113.00R.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,082,628, Cl. 204-64.00T.
Soong, Jeanne F.: *See—*
Soong, Tsai C.; and Soong, Jeanne F., 4,082,275, Cl. 273-73.00D.
Soong, Tsai C.; and Soong, Jeanne F. Sport racket. 4,082,275, Cl. 273-73.00D.
Soudijn, Willem: *See—*
van Wijngaarden, Ineke; Soudijn, Willem; Vandenberk, Jan; and Hens, Jozef Fr., 4,082,755, Cl. 260-293.600.
South, Peter: *See—*
Rangi, Rajindar S.; and South, Peter, 4,082,479, Cl. 416-23.000.
Southern Business Systems of Greensboro, Inc.: *See—*
Williams, Charles V., 4,082,047, Cl. 109-21.500.
Southwire Company: *See—*
Bonnamour, Yves B., 4,082,136, Cl. 164-433.000.
Headrick, J. Charles; Starnes, R. Emory; and Peel, Robert C., 4,082,212, Cl. 228-147.000.
Schoerner, Roger J.; and Chia, Enrique C., 4,082,573, Cl. 148-2.000.
Spector George: *See—*
Walters, Adolbert F.; and Spector George, 4,082,939, Cl. 219-202.000.
Speier, John L., to Dow Corning Corporation. Method of preparing mercaptans. 4,082,790, Cl. 260-448.80R.
Spence, Andrew P., to Atlantic Richfield Company; NM Uranium, Inc.; and United States Steel Corporation. Method for the recovery of a material. 4,082,359, Cl. 299-4.000.
Spence, John H.: *See—*
McNally, George S.; Naik, Dilip T.; and Spence, John H., 4,082,045, Cl. 105-411.000.
Sperry Rand Corporation: *See—*
Ehrhart, Philip J., 4,081,946, Cl. 56-14.400.
Locke, David Richard, 4,081,902, Cl. 30-43.920.
Sauter, Gerald Francis; and Nelson, George Franklin, 4,082,424, Cl. 350-96.110.
Spiliotis, Nicholas J.; Schevey, William R.; and Himler, Donald W., to Allied Chemical Corporation. Plating method with lead or tin sublayer. 4,082,621, Cl. 204-38.00B.
Spinner, Ulrich: *See—*
Menth, Anton; Perry, Anthony J.; and Spinner, Ulrich, 4,082,582, Cl. 148-102.000.
Sprenger, Alfred Paul. Oil well pump. 4,082,483, Cl. 417-554.000.
Staker, Anthony Gail. Programmable variable-rate electric adapting device for watt-hour meters. 4,082,999, Cl. 324-116.000.
Stampfli, Harald, to Lucifer S.A. Electromagnetic two-way valve. 4,082,116, Cl. 137-630.140.
Stamvik, Anders Robert: *See—*
Fex, Hans Jacob; Kristensson, Sten Krister; and Stamvik, Anders Robert, 4,082,779, Cl. 260-397.500.
Standard Oil Company, The: *See—*
Aziz, Walid Y.; Ball, Lawrence E.; and Rosen, Irving, 4,082,728, Cl. 260-67.00A.
Coffey, Gerald P.; and Mazeke, Herbert F., 4,082,818, Cl. 260-879.000.
Li, George S.; and Dirks, Gary W., 4,082,819, Cl. 260-879.000.
Li, George S.; and Jorkasky, Richard J., II, 4,082,820, Cl. 260-879.000.
Shaw, Wilfrid G.; and Terrill, David B., 4,082,698, Cl. 252-469.000.
Standard Oil Company (Indiana): *See—*
Fielding, Ivor R.; and Poppe, Wassily, 4,082,716, Cl. 260-30.40R.
Wennerberg, Arnold N.; and O'Grady, Thomas M., 4,082,694, Cl. 252-444.000.
Staniak, Elzbieta: *See—*
Szadkowska, Maria; Pisarek, Jerzy; Dzik, Boleslaw; Staniak, Elzbieta; Lipniewska, Danuta; and Bijok, Franciszek, 4,082,853, Cl. 426-36.000.
Starnes, R. Emory: *See—*
Headrick, J. Charles; Starnes, R. Emory; and Peel, Robert C., 4,082,212, Cl. 228-147.000.
Stauffer Chemical Company: *See—*
Baker, Don R.; and Walker, Francis H., 4,082,799, Cl. 260-559.00B.
Baker, Don R.; and Walker, Francis H., 4,082,800, Cl. 260-559.00B.
Stedman, Robert N., to Caterpillar Tractor Co. Articulated high lift vehicle. 4,082,197, Cl. 214-132.000.
Stein, Merle R., to United States Steel Corporation. Tool-clamping device and method of setting up a pipe cutoff machine. 4,082,020, Cl. 82-37.000.
Stein, Philip C. Seal for sealing between a rotating member and a housing. 4,082,296, Cl. 277-3.000.
Stein, Thomas R.: *See—*
Rosinski, Edward J.; Stein, Thomas R.; and Fischer, Ronald H., 4,082,695, Cl. 252-465.000.
Steinborn, Heinrich A.: *See—*
Timmann, Peter; and Steinborn, Heinrich A., 4,082,051, Cl. 114-72.000.
Steiner, Edward L., to Xerox Corporation. Toner control system for an electrostatic reproduction machine. 4,082,445, Cl. 355-14.000.
Steiner, Peter, to Foster Wheeler Energy Corporation. Process for the gasification of coal. 4,082,519, Cl. 48-202.000.
Steklenski, David J.; and Albuerne, Evelio A. Perez, to Eastman Kodak Company. Electrophotographic element containing a multilayer interlayer. 4,082,551, Cl. 96-1.0PC.
Stephan, Bernd; Hund, Franz; and Holznagel, Wilhelm, to Bayer Aktiengesellschaft. Production of iron oxide pigments with improved resistance to oxidation. 4,082,905, Cl. 428-538.000.
Stephan, Wolfgang, to Biotest-Serum-Institut GmbH. Production of intravenously applicable native human immune globulin having a normal half-life. 4,082,734, Cl. 260-112.00B.
Stephens, Donald S.: *See—*
Jaklic, Albin, Jr.; and Stephens, Donald S., 4,082,916, Cl. 174-52.0PE.
Stephenson, Robert L.; and Loomba, Yogendra S., to Allied Chemical Corporation. Free pull web sensitive retractor. 4,082,236, Cl. 242-107.40B.
Stepniak, Frank M., to Amerace Corporation. Loadbreak male contact assembly. 4,082,405, Cl. 339-111.000.
Sternberg, Ernest R., to White Motor Corporation. Highway vehicle with hydraulically driven power dolly. 4,082,157, Cl. 180-14.00A.
Steude, Holm: *See—*
Heinze, Christoph; Ruchlak, Kasimir; and Steude, Holm, 4,082,659, Cl. 210-23.00F.
Stevens, Robert. Tennis racket. 4,082,274, Cl. 273-73.00C.
Stewart, Byron C.: *See—*
Reime, Roy O.; and Stewart, Byron C., 4,082,988, Cl. 318-139.000.
Stewart, Glenn M. Collapsible camp supply unit. 4,082,389, Cl. 312-258.000.
Stewart, Robert M.: *See—*
Cheng, Richard C. M.; Dennis, Gene Patrick; and Stewart, Robert M., 4,082,220, Cl. 238-10.00F.
Stiger, Darrel E. Drill attachment. 4,082,474, Cl. 408-110.000.

Stiles, John Callender; and Ferriss, Lincoln Stark, to Singer Company, The. Electrostatic pickoff and torquer. 4,082,990, Cl. 318-662.000.
Sting, Donald W.; and Ott, Denis P., to Hancor, Inc. Connecting joint for corrugated plastic tubing. 4,082,327, Cl. 285-401.000.
Stobb, Walter John. Apparatus and method for handling bundles of sheets. 4,082,174, Cl. 198-368.000.
Stonehouse, Ernest, to Mardon Flexible Packaging Limited. Method for making a wrapping material. 4,082,594, Cl. 156-253.000.
Storck, Glenn E.; and Kominiak, Andrew A., to Amerace Corporation. Electrical connectors and contact assemblies therefor. 4,082,410, Cl. 339-252.00R.
Storck, Glenn E., to Amerace Corporation. Electrical connectors and contact assemblies thereof. 4,082,411, Cl. 339-252.00R.
Stork Amsterdam B.V.: *See—*
Brummelhuis, Johannes Arnold Julius, 4,082,221, Cl. 239-214.250.
Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, to Warner-Lambert Company. Benzo(b)thiophene derivatives. 4,082,770, Cl. 260-330.500.
Stout, Eldon Charles: *See—*
Duffy, Robert Donovan; and Stout, Eldon Charles, 4,082,703, Cl. 260-2.5BE.
Stove, Flemming, to Danfoss A/S. Control circuit for a servo-motor. 4,081,963, Cl. 60-528.000.
Strandberg, Per: *See—*
Hedvall, Per; and Strandberg, Per, 4,082,656, Cl. 209-222.000.
Stratton, Raymond G.: *See—*
Raabe, Ralph C.; Cleffman, Roger G.; and Stratton, Raymond G., 4,082,592, Cl. 156-153.000.
Strekal, Leonid Pavlovich: *See—*
Istomin, Evgeny Ivanovich; Ivanenko, Alexandr Fedorovich; Strekal, Leonid Pavlovich; Vasiliev, Adolf Alfonsovich; and Vaskin, Boris Denisovich, 4,082,937, Cl. 219-121.0EB.
Strick Corporation: *See—*
Schmidt, George A.; Zubko, Ronald L.; and Abolins, Andrew, 4,082,357, Cl. 298-27.000.
Strickland, James W. Surgery table. 4,082,257, Cl. 269-328.000.
Strickland, Robert E. Alternately ascending and descending aquatic article. 4,082,063, Cl. 119-5.000.
Strickland, Robert V. Chain with guide. 4,082,007, Cl. 74-240.000.
Strong, Herbert M., to General Electric Company. Manufacture of diamond products. 4,082,185, Cl. 206-525.000.
Strunc, Gerald R.: *See—*
Jensen, Gerald A.; Harvey, Ronald B.; Caulfield, Patrick J.; Putzke, Dwayne H.; and Strunc, Gerald R., 4,082,943, Cl. 235-303.100.
Sturm, Michael, to Display Corporation International. Device for displaying wrist watches. 4,082,183, Cl. 206-301.000.
Sturm, Ronald Leo; and Smith, James Curtis, to Oxford Laboratories Inc. Liquid dispenser with means for automatically purging air therefrom during liquid loading. 4,082,121, Cl. 141-27.000.
Sugawara, Kinichi, to Nippon Steel Corporation. Method for the preliminary treatment of materials for sintering. 4,082,539, Cl. 75-3.000.
Sugimoto, Akira: *See—*
Ohtsu, Takao; Nakamura, Yukinobu; and Sugimoto, Akira, 4,082,997, Cl. 324-65.00R.
Sugiyama, Yuichi; Kaido, Hiroyuki; and Koyama, Tsuneo, to Yokohama Rubber Company, Limited, The. Rubber composition containing metal salt of hydroxy benzoic acid. 4,082,909, Cl. 526-4.000.
Sukopp, Hans: *See—*
Metzler, Gerhart; Rother, Peter; and Sukopp, Hans, 4,082,291, Cl. 274-23.00R.
Sukow, Daniel L.; Smith, Richard A.; and Cockroft, James B., to Oster Corporation. Bag sealer. 4,082,941, Cl. 219-243.000.
Sumitomo Chemical Company, Limited: *See—*
Kameda, Nobuyuki; Hisada, Yoshio; Kato, Toshiro; and Fujinami, Akira, 4,082,849, Cl. 424-274.000.
Nakagawa, Masataka; Iga, Tadasu; and Fukura, Akira, 4,082,802, Cl. 260-574.000.
Suzuki, Yoshio; Minai, Masayoshi; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, 4,082,913, Cl. 560-102.000.
Yamahara, Takeshi; and Inokuma, Shun, 4,082,767, Cl. 260-326.14T.
Sumitomo Durez Company, Ltd.: *See—*
Aoki, Takao; Kako, Yuji; Kikuga, Toyoji; and Hatano, Keizo, 4,082,661, Cl. 210-40.000.
Sumitomo Electric Industries, Ltd.: *See—*
Okita, Koichi, 4,082,893, Cl. 428-376.000.
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,082,420, Cl. 350-96.310.
Summaria, Louis: *See—*
Robbins, Kenneth C.; and Summaria, Louis, 4,082,612, Cl. 195-62.000.
Sun Chemical Corporation: *See—*
Brigham, Ward E., 4,082,455, Cl. 355-100.000.
Sun, Tsu-Hung; and Basiulis, Algerd, to Hughes Aircraft Company. Heat pipe actuated valve. 4,082,109, Cl. 137-340.000.
Suncrux Incorporated: *See—*
Hsu, Ying-Yen, 4,082,428, Cl. 350-350.000.
Sundstrand Data Control, Inc.: *See—*
Kirschner, Robert Kay, 4,082,432, Cl. 350-174.000.
Sundstrom, John A.: *See—*
Wortham, Otis W.; and Sundstrom, John A., 4,081,975, Cl. 68-18.0FA.
Super Stud Products, Inc.: *See—*
Dawson, Raymond B., 4,081,979, Cl. 70-58.000.
Superior Oil Company, The: *See—*
Knight, John H.; St. Cyr, Lewis A.; and Wilson, Omer L., 4,082,645, Cl. 208-11.00R.
Sutures Inc.: *See—*
Esemplare, Pascal E.; and Beeferman, Dennis, 4,082,862, Cl. 427-133.000.
Suzuki, Akira; Kubo, Keiji; Kunitake, Suguru; and Arai, Fumiaki, to Kabushiki Kaisha Ricoh. Spark-recording type printing method and spark-recording material for use thereof. 4,082,902, Cl. 428-457.000.
Suzuki, Toru: *See—*
Yamada, Muneki; Hirata, Sadao; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,082,854, Cl. 426-106.000.
Suzuki, Tuneo: *See—*
Ishii, Susumu; and Suzuki, Tuneo, 4,081,883, Cl. 24-205.14R.
Suzuki, Yoshio; Minai, Masayoshi; Hamma, Noritaka; Murayama, Eiichi; and Aono, Shunji, to Sumitomo Chemical Company, Limited. Phenoxyalicyclic carboxylic acid derivatives. 4,082,913, Cl. 560-102.000.
Svatek, Thomas A.: *See—*
Driscoll, John J.; Svatek, Thomas A.; and Wareham, Richard R., 4,082,446, Cl. 355-27.000.
Svenska Dataregister AB: *See—*
Englund, Gosta Roland, 4,082,035, Cl. 101-93.040.
Svoboda, Josef: *See—*
Krob, Erwin; Weigl, Erwin; and Svoboda, Josef, 4,082,315, Cl. 280-631.000.
Swann, Brian Picton: *See—*
Evans, Delme; Jolley, Michael Ralph John; Ross, William James; and Swann, Brian Picton, 4,082,771, Cl. 260-332.20R.
Swearingen, Judson S. Bearing assembly. 4,082,379, Cl. 308-26.000.
Swenson, William J., to Raymond International, Inc. Control of hydraulically powered equipment. 4,082,032, Cl. 91-216.00B.
Swinkels, Godefridus M.: *See—*
Milner, Edward F. G.; Parker, Ernest G.; and Swinkels, Godefridus M., 4,082,629, Cl. 204-66.000.
Swiss Aluminium Ltd.: *See—*
Anthony, William H.; Brock, Andrew J.; and Gullotti, Damian V., 4,082,574, Cl. 148-2.000.
Switchcraft, Inc.: *See—*
Bailey, James R.; and Lavigne, Vernon W., 4,082,409, Cl. 339-182.00R.
Switzer, Kenneth Oscar: *See—*
Werner, Gregory Keith; Switzer, Kenneth Oscar; and St. Laurent, Raymond G., 4,082,371, Cl. 305-56.000.
Symborski, Alex P., to Owens-Corning Fiberglas Corporation. Adjustment mechanism. 4,082,469, Cl. 403-24.000.
Syntex (U.S.A.) Inc.: *See—*
Jones, Gordon H.; Moffatt, John G.; and Nestor, John J., Jr., 4,082,735, Cl. 260-112.50R.
Jones, Gordon H.; Moffatt, John G.; and Nestor, John J., Jr., 4,082,736, Cl. 260-112.50R.
Systems Research Laboratories, Inc.: *See—*
Dehait, Jack T.; Dietz, David C.; Snyder, Milo S.; and Talor, Francis M., 4,082,463, Cl. 356-167.000.
Syvakari, Pertti: *See—*
Gustafsson, Sven-Goran; Nilsson, Jan; and Syvakari, Pertti, 4,081,984, Cl. 72-60.000.
Szadkowska, Maria; Pisarek, Jerzy; Dzik, Boleslaw; Staniak, Elzbieta; Lipniewska, Danuta; and Bijok, Franciszek, to Instytut Przemyslu Mleczarskiego. Method for coagulating milk proteins. 4,082,853, Cl. 426-36.000.
Szafianski, Marius. Ventilated handle for tennis rackets or the like. 4,082,276, Cl. 273-75.000.
Szeberenyi, Szabolcz: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,082,813, Cl. 260-618.00B.
Szporny, Laszlo: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,082,813, Cl. 260-618.00B.
Szymanis, Edward, to Canadian General Electric Company Limited. Rotary lawn mower with separate grass pick up. 4,081,947, Cl. 56-13.300.
Tabler, Donald C.: *See—*
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 4,082,815, Cl. 260-683.200.
Tada, Osamu; Nakagawa, Mutsuaki; Mori, Hiroshi; Wakasa, Yutaka; Kataoka, Koju; Inoue, Tadanari; and Uchiike, Hisayuki, to Yokogawa Electric Works, Ltd. Process control system with signal conversion to standard intermediate signals carrying data as a function of time duration. 4,082,942, Cl. 364-111.000.
Taguchi, Tetsuya: *See—*
Tsunekawa, Tokuichi; Nakamura, Zenso; Taguchi, Tetsuya; Uchidoi, Masanori; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,083,059, Cl. 354-149.000.
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Takagi, Toshinori, to Sharp Kabushiki Kaisha. Ion plating method. 4,082,636, Cl. 204-192.00N.
Takahara, Takao; and Misaki, Susumu, to Daikin Kogyo Co., Ltd. Process for fluorination of uracil. 4,082,752, Cl. 260-260.000.
Takahashi, Hiroaki: *See—*
Tatsuta, Hiroshi; Fukai, Masakazu; and Takahashi, Hiroaki, 4,082,686, Cl. 252-299.000.
Takahashi, Ken: *See—*
Kamiya, Hiroyuki; Takahashi, Ken; Watanabe, Seiji; and Kanazawa, Tomohisa, 4,082,406, Cl. 339-112.00L.

Takahashi, Miyoshi: *See—*
Yamamoto, Hiroe; Takahashi, Noriyosni; and Takahashi, Miyoshi, 4,082,974, Cl. 310-179.000.
Takahashi, Noriyoshi: *See—*
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Takashima, Tadao: *See—*
Tanaka, Yoshio; Shibata, Tatsuo; Matsuo, Tatsuo; Takashima, Tadao; and Hori, Sankichi, 4,082,252, Cl. 266-142.000.
Takayama, Hiroshi; and Aizawa, Tatsuo, to Mita Industrial Company. Magnetic developer for electrostatic photography and process for preparation thereof. 4,082,681, Cl. 252-62.10P.
Takeda Chemical Industries, Ltd.: *See—*
Kuwada, Yutaka; Meguro, Kanji; and Tawada, Hiroyuki, 4,082,764, Cl. 260-308.00R.
Miki, Takuichi; Hiraga, Kentaro; and Goto, Giichi, 4,082,780, Cl. 260-397.500.
Takeishi, Norikazu. Oil replenishing cartridge. 4,082,163, Cl. 184-105.00R.
Talcott, Thomas D., to Dow Corning Corporation. Method of storing blood and a blood storage bag therefor. 4,082,509, Cl. 21-58.000.
Talor, Francis M.: *See—*
Dehait, Jack T.; Dietz, David C.; Snyder, Milo S.; and Talor, Francis M., 4,082,463, Cl. 356-167.000.
Tamm, Paul W., to Chevron Research Company. Catalyst carrier, its method of preparation and a reforming catalyst supported on the carrier. 4,082,697, Cl. 252-466.0PT.
Tan, Gim: *See—*
Gatsis, John G.; and Tan, Gim, 4,082,643, Cl. 208-8.000.
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Tanaka, Eiji: *See—*
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, 4,082,628, Cl. 204-64.00T.
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Kuwada, Yutaka; Meguro, Kanji; and Tawada, Hiroyuki, 4,082,764, Cl. 260-308.00R.
Taylor, Alexander. Air current deflecting device. 4,082,340, Cl. 296-1.00S.
Taylor, Edwin Michael: *See—*
Coates, William John; Roe, Anthony Maitland; Slater, Robert Antony; and Taylor, Edwin Michael, 4,082,843, Cl. 424-250.000.
Taylor, James B., Jr.; and Fritz, Galen F., to Texas Instruments Incorporated. Method of manufacturing an electronic calculator utilizing a flexible carrier. 4,081,898, Cl. 29-622.000.
Taylor, Otis C.: *See—*
Wiley, A. C., Jr.; and Taylor, Otis C., 4,082,630, Cl. 205-98.000.
Taymar Limited: *See—*
Oakes, Malcolm Campbell, 4,082,993, Cl. 137-322.000.
TDK Electronics Co., Ltd.: *See—*
Otoshi, Yutaka; and Ishino, Ken, 4,082,560, Cl. 106-45.000.
Teach, Ted L., to Laserplane Corporation. Backhoe bucket. 4,081,919, Cl. 37-103.000.
Teague, J. T., to LaSalle, LeRoy. Pipe handling apparatus. 4,082,193, Cl. 214-2.500.
Tecl, Bohuslav: *See—*
Boe, Hans; Hoehn, Ralf; Tecl, Bohuslav; and Kirsch, Wilhelm, 4,082,878, Cl. 428-195.000.
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Leiber, Heinz; and Blasius, Udo, 4,082,370, Cl. 303-92.000.
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Teledyne Industries, Inc.: *See—*
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Telefonaktiebolaget L M Ericsson: *See—*
Carlqvist, Bengt Roland; and Eriksson, Anders Gunnar, 4,082,924, Cl. 179-84.0VF.
Hertsius, Lars-Olov; and Arneborn, Anders, 4,082,023, Cl. 83-293.000.
Teleglobe Pay-TV System, Inc.: *See—*
Chomet, Marc, 4,082,921, Cl. 179-2.00A.
Tenneco Chemicals, Inc.: *See—*
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Rudner, Bernard; and Noone, Thomas M., 4,082,704, Cl. 260-2.50A.
Tenneco Inc.: *See—*
Laundy, James R., 4,082,325, Cl. 285-155.000.
Terrill, David B.: *See—*
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Terry, Franklin E.: *See—*
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Terry, John Christopher: *See—*
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Texaco Inc.: *See—*
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McGahey, Dean C., 4,082,122, Cl. 141-5.000.
Texas Instruments Incorporated: *See—*
Kinnebrew, Gerald P.; Watkins, Bobby Mack; and Texas Instruments Incorporated, 4,081,928, Cl. 51-131.000.
Lou, Perry W., 4,082,966, Cl. 307-362.000.
Taylor, James B., Jr.; and Fritz, Galen F., 4,081,898, Cl. 29-622.000.
Thermacore, Inc.: *See—*
Eastman, George Y., 4,082,575, Cl. 148-6.350.
Theys, Andre, to Fabrique Nationale Herstal S.A. Multi level presser-foot device. 4,081,973, Cl. 66-64.000.
Thirumalachar, Mandayam J.; Narasimhan, Mandayam J.; and Anderson, John A., to University of Minnesota, The Regents of the. Process for the production of insulin by genetically transformed fungal cells. 4,082,613, Cl. 195-76.000.
Thomason, Harry E. Solar energy. 4,082,143, Cl. 165-104.00S.
Thompson, George Horace Brooke; and Lovelace, David Francis, to International Standard Electric Corporation. Optical waveguide couplers. 4,082,419, Cl. 350-96.120.
Thomson-CSF: *See—*
Autran, Jean Michel; and Epsztein, Bernard, 4,083,021, Cl. 333-72.000.
Thor Dahl, Inc.: *See—*
McPherson, John B.; and Gunther, William H., Jr., 4,082,603, Cl. 156-654.000.
Thorneycroft, Malcolm: *See—*
Hodgson, Brian; Fairnington, Robert; Thorneycroft, Malcolm; and Grant, Ronald Malcolm, 4,082,031, Cl. 90-4.000.
Thornton, Bryce G.: *See—*
Schutt, Elmer F.; Thornton, Bryce G.; and Bentivegna, Charles R., Jr., 4,082,039, Cl. 101-450.000.
Thornton, Roy F.; and Weininger, Joseph L., to General Electric Company. Method of producing a sealed electrolyte-limited lead-acid battery. 4,081,899, Cl. 29-623.200.
Thorsen, Niels Peter, to Danfoss A/S. Electric switch actuated in dependence on pressure, particularly an evaporator thermostat for refrigerators. 4,082,929, Cl. 200-83.0SA.
Thuleen, Richard A.; and Richard, John E., to Litton Systems, Inc. Pyrolytic lock assembly. 4,082,078, Cl. 126-197.000.
Tile Council of America: *See—*
Ellis, Jeffrey R.; and Wagner, Herman B., 4,082,563, Cl. 106-90.000.
Timex Corporation: *See—*
Crutcher, William C., 4,081,953, Cl. 58-50.00R.
Timmann, Peter; and Steinborn, Heinrich A., to O & K Orenstein & Koppel Aktiengesellschaft Werk Lubeck. Container ship construction. 4,082,051, Cl. 114-72.000.
Toepelt, Werner; and Bernier, Richard, to Coats & Clark, Inc. Locking zipper slider, and zipper incorporating said slider. 4,081,882, Cl. 24-205.00R.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, to Sony Corporation. Method of adjusting the hardness of a titanium metal. 4,082,628, Cl. 204-64.00T.
Tokutomi, Seijiro: *See—*
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Toledo, Romeo T., to Tracy-Luckey Co., Inc. Pecan-worm separator process and apparatus. 4,082,655, Cl. 209-173.000.
Tomari, Haruo: *See—*
Shimogori, Kazutoshi; Sato, Hiroshi; and Tomari, Haruo, 4,082,900, Cl. 428-469.000.
Tomforde, Johann, to Daimler-Benz Aktiengesellschaft. Shell-shaped children's seat for vehicles. 4,082,350, Cl. 297-243.000.
Tomlinson, Leroy O.: *See—*
Baker, Jack M.; Clark, Gordon W.; Harper, Douglas M.; and Tomlinson, Leroy O., 4,081,956, Cl. 60-39.18B.
Toneray Covers, Inc.: *See—*
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Hasegawa, Katsumi; Nakanishi, Toru; and Oka, Toshihiko, 4,081,888, Cl. 28-285.000.
Toray Silicone Company, Ltd.: *See—*
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Torley, Jozsef: *See—*
Toth, Edit; Torley, Jozsef; Gorog, Sandor; Szporny, Laszlo; Palosi, Eva; and Szeberenyi, Szabolcz, 4,082,813, Cl. 260-618.00B.
Torres, Silvestre Sanchez. Catalytic converter for transforming polluting gases into non-polluting gases. 4,082,514, Cl. 23-288.00F.
Toth Aluminum Corporation: *See—*
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Toth, Anton: *See—*
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Towmotor Corporation: *See—*
Friesen, Larry Dean; and Johannson, Richard James, 4,082,199, Cl. 214-672.000.
Toyo Seikan Kaisha Limited: *See—*
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Toyoda, Kenichi: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Tracy-Luckey Co., Inc.: *See—*
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Trane Company, The: *See—*
Eber, David Henry, 4,081,971, Cl. 62-216.000.
Hantke, Gerhard John; and Ring, Harry Kenneth, Jr., 4,082,114, Cl. 137-625.370.
Traylor, Fling Armstrong, Jr., to El-Do, Inc. Carpeting and method and apparatus for making carpeting. 4,082,874, Cl. 428-54.000.
Trbovich, Nicholas D. Air cushion game. 4,082,282, Cl. 273-126.00R.
Trefilunion: *See—*
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Bickl, Horst; Treiber, Helmut; Findeis, Gunter; Knor, Bernhard; Payrhammer, Bernd; and Fergg, Berthold, 4,082,465, Cl. 356-203.000.
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Minin, Vladilen Fedorovich; Gambarov, Vitaly Stepanovich; Kachan, Mikhail Samuilovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; and Trishin, Jury Alexeevich, 4,081,982, Cl. 72-56.000.
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Evancho, Joseph W.; Shabel, Barrie S.; and Truckner, William G., 4,082,578, Cl. 148-12.70A.
TRW Inc.: *See—*
Breuer, David R., 4,083,043, Cl. 340-347.0AD.
Brooks, Robert Ellison; and Winter, Donald Charles, 4,082,415, Cl. 350-3.830.
Tsao, Carson K. H.: *See—*
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Tsunekawa, Tokuichi; Nakamura, Zenso; Taguchi, Tetsuya; Uchidoi, Masanori; Aizawa, Hiroshi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Automatic exposure control system for flash photography. 4,083,059, Cl. 354-149.000.
Tsuzuki, Yu: *See—*
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Turckes, Raymond J.: *See—*
Horn, Charles F.; Lerch, Arthur L.; Turckes, Raymond J.; and Nagel, Ronald P., 4,082,022, Cl. 83-82.000.
Turner, Roland P. Stowable galley. 4,082,391, Cl. 312-314.000.
Tyco Industries, Inc.: *See—*
Cheng, Richard C. M.; Dennis, Gene Patrick; and Stewart, Robert M., 4,082,220, Cl. 238-10.00F.
U C B, Societe Anonyme: *See—*
Vrancken, August; Dufour, Paul; Noat, Jacques; and Holderic, Jean, 4,082,710, Cl. 260-23.0TN.
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Uchiyama, Takashi: *See—*
Tsunekawa, Tokuichi; Nakamura, Zenso; Taguchi, Tetsuya; Uchidoi, Masanori; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,083,059, Cl. 354-149.000.
Ueno, Tadayoshi; and Itaya, Akio, to Hitachi Printing Co. Ltd.; and Nikka Kabushiki Kaisha. Apparatus for automatically removing dust from a form cylinder of a printing machine. 4,082,038, Cl. 101-425.000.
Underberg, Robert L., to Realist, Inc. Optical sighting instrument. 4,082,466, Cl. 356-249.000.
Unibra S.A.: *See—*
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Union Carbide Corporation: *See—*
Duffy, Robert Donovan; and Stout, Eldon Charles, 4,082,703, Cl. 260-2.5BE.
Koenig, Harvey Steven; and Raines, Russell Harold, 4,082,506, Cl. 8-91.000.
Yenni, Donald McKelvie, 4,082,870, Cl. 427-425.000.
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Martin, Frank Stephen; Melvin, Terence; and Pieroni, Joseph Kirby, 4,082,288, Cl. 273-218.000.
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Rashid, Sheikh A.; Bray, Hugh S.; and Boarini, Edward J., 4,082,885, Cl. 428-281.000.
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Agriculture: *See—*
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Hornbeck, Donald W.; and O'Loughlin, James P., 4,082,965, Cl. 307-260.000.
Satriana, Daniel R.; and Bracuti, Arthur J., 4,082,584, Cl. 149-109.400.
Energy: *See—*
Divona, Charles J., 4,082,607, Cl. 176-19.0LD.
Kolleck, Floyd W., 4,082,531, Cl. 65-296.000.
Moran, Paul R., 4,082,951, Cl. 250-336.000.
Health, Education and Welfare: *See—*
Gal, Andrew E., 4,082,781, Cl. 260-403.000.
National Aeronautics and Space Administration: *See—*
Evans, John C., Jr., 4,082,569, Cl. 136-89.0CC.
Long, Walt C.; and Williams, Milton L., 4,082,001, Cl. 73-756.000.
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Glista, Andrew S.; and Katz, Rodney S., 4,082,423, Cl. 350-96.230.
Kaloi, Cyril M., 4,083,046, Cl. 343-700.0MS.
Mosher, Paul R., 4,082,583, Cl. 149-96.000.
Nannelli, Piero L.; and Monsimer, Harold G., 4,082,793, Cl. 260-502.40R.
Pharo, Lawrence C., Jr., 4,083,031, Cl. 340-5.00R.
U.S. Philips Corporation: *See—*
Bahlmann, Johannes P. M.; and Zwijsen, Wilhelmus A. J. M., 4,083,036, Cl. 340-166.00R.
Bolhuis, Pieter Jan, 4,082,985, Cl. 315-241.00P.
Cukrowski, Georg, 4,082,290, Cl. 274-9.00A.
Hunter, Donald Noel, 4,082,556, Cl. 96-115.00R.
Kok, Johannes George Jacobus; van Moorselaar, Rudolf; and Noordermeer, Aart, 4,082,721, Cl. 260-42.210.
Miedema, Andries Rinse; Buschow, Kurt Heinz Jurgen; and Mulder, Jan, 4,082,138, Cl. 165-4.000.
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Learmont, Robert P., 4,082,358, Cl. 299-4.000.
Spence, Andrew P., 4,082,359, Cl. 299-4.000.
Stein, Merle R., 4,082,020, Cl. 82-37.000.
United States Trading International, Inc.: *See—*
De Long, Charles F., 4,082,884, Cl. 428-262.000.
United Technologies Corporation: *See—*
Cox, George Benjamin, Jr., 4,081,957, Cl. 60-39.360.
Fortmann, William E., 4,082,375, Cl. 308-9.000.
United Turbine AB & Co.: *See—*
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University of California, Regents of the: *See—*
Brown, Daniel Maitland, 4,082,055, Cl. 114-245.000.
University of Edinburgh, The University Court of the: *See—*
Jones, Robert L., 4,082,789, Cl. 560-121.000.
University of Minnesota, The Regents of the: *See—*
Thirumalachar, Mandayam J.; Narasimhan, Mandayam J.; and Anderson, John A., 4,082,613, Cl. 195-76.000.
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University of Utah: *See—*
Clark, Lealand L., 4,082,846, Cl. 424-266.000.
UOP Inc.: *See—*
Antos, George J., 4,082,651, Cl. 208-139.000.
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Gatsis, John G.; and Tan, Gim, 4,082,644, Cl. 208-8.000.
Gewartowski, Steve A., 4,082,654, Cl. 208-352.000.
Hutchings, Le Roi E.; and Sahlin, Thomas E., 4,082,647, Cl. 208-78.000.
Pollitzer, Ernest L.; and Hayes, John C., 4,082,649, Cl. 208-111.000.
Robinson, Delmar W., 4,082,696, Cl. 252-466.00B.
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Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; Petzold, Manfred; and Uphues, Gunter, 4,082,689, Cl. 252-321.000.

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Kelly, Robert C.; and Nelson, Norman A., 4,082,776, Cl. 260-343.600.
Morton, Douglas Ross, Jr., 4,082,782, Cl. 260-408.000.
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Morton, Douglas Ross, Jr., 4,082,794, Cl. 260-514.00D.
Wingard, Robert Dean; and Leidal, Shirley Margaret, 4,082,512, Cl. 23-252.00R.
Youngdale, Gilbert A., 4,082,783, Cl. 260-410.90R.
Upshaw, Jackson E.; and Meisch, Charles Edward, to Howmedica, Inc. Total anatomical knee prosthesis. 4,081,866, Cl. 3-1.911.
Urban, Friedrich: *See—*
Buechner, Oskar; Schlichthaerle, Gottfried; and Urban, Friedrich, 4,082,910, Cl. 528-481.000.
Urbush, Richard L., to Andis Clipper Co. Electric clipper. 4,081,905, Cl. 30-221.000.
USM Corporation: *See—*
Schmidt, Alexander, Sr.; Schmidt, Walter; and Schmidt, Alexander, Jr., 4,081,977, Cl. 69-42.000.
Vaas, Frederick T., Jr.: *See—*
Bluhm, Elmer; and Vaas, Frederick T., Jr., 4,081,890, Cl. 29-157.00C.
Vacuumschmelze GmbH: *See—*
Pfeifer, Friedrich; and Klein, Gunter, 4,082,580, Cl. 148-31.550.
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Heller, Adam; Miller, Barry; and Vadimsky, Richard George, 4,082,624, Cl. 204-47.000.
Valdespino, Joseph M.; and Brandl, Ronald A. Recreational vehicle leveling and support system. 4,082,249, Cl. 254-45.000.
Vanaglash, John J., Jr., to Burr-Brown Research Corporation. Gold plating process and product produced thereby. 4,082,908, Cl. 428-672.000.
Vanassche, Willy Joseph: *See—*
Pattyn, Herman Alberik; Vanassche, Willy Joseph; and Philipparts, Herman Adelbert, 4,082,554, Cl. 96-101.000.
Van Auken, Richard L.; and Pirtle, Allwyn W. Golf club shaft. 4,082,277, Cl. 273-80.00R.
Van Ausdall, James G., to Ceel-Co. Flexible protective cover sections, assemblies and form system. 4,081,941, Cl. 52-726.000.
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van Wijngaarden, Ineke; Soudijn, Willem; Vandenberk, Jan; and Hens, Jozef Fr., 4,082,755, Cl. 260-293.600.
Vanderpool, Charles C. Garment bag sealing machine. 4,082,596, Cl. 156-359.000.
van der Vleugel, Bernard Evert: *See—*
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van Heijst, Willem Jan, to Single Buoy Moorings, Inc. Coupling between an anchor under water and a buoyant body. 4,082,050, Cl. 114-53.000.
van Moorselaar, Rudolf: *See—*
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Van Nocker, Melvin, to Prab Conveyors, Inc. Harpoon-type conveyor. 4,082,178, Cl. 198-741.000.
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Zangrando, Donald Roy; and Kelley, Clifford Herrol, Jr., 4,083,016, Cl. 331-56.000.
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Vepy, Tamas A., to Picker Corporation. X-ray film changer for serial radiography. 4,082,956, Cl. 250-480.000.
Vesperman, William Charles: *See—*
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Vitale, Ben. Gum massaging implement. 4,081,877, Cl. 15-188.000.
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Volk, Anthony J. Disposable cooking thermometer structure. 4,082,000, Cl. 73-358.000.
Volta, Victor S.; and Martin, Joe E. Interior security device for double doors. 4,082,334, Cl. 292-288.000.
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Vonusa, Joseph S. Lid remover. 4,082,016, Cl. 81-3.430.
Voorhies, John Davidson, to American Cyanamid Company. Process for improved carbon-supported hydrodesulfurization catalysts. 4,082,652, Cl. 208-216.000.
Vorbruggen, Helmut, to Schering Aktiengesellschaft. Process for the preparation of nucleosides. 4,082,911, Cl. 536-23.000.
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Vrancken, August; Dufour, Paul; Noat, Jacques; and Holderic, Jean, to U C B, Societe Anonyme. Isocyanate-modified acrylic compositions. 4,082,710, Cl. 260-23.0TN.
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Ward, Joseph E., III; and Huber, John C., to Minnesota Mining and Manufacturing Company. Apparatus for copying graphic images including the processing of incoherent radiation with a spatial filter. 4,082,429, Cl. 350-162.0SF.
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Ward, Truman L.; and Benerito, Ruth R., to United States of America, Agriculture. Process for imparting wrinkle recovery to cotton fabrics with vapors from glycidol. 4,082,500, Cl. 8-120.000.
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Watson, George A.: *See—*
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Watt, William Doyle, Jr.; and Flowerday, Dale L., to Keeler Corporation. Collar attachment for support hook. 4,082,243, Cl. 248-205.00R.

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Wehde, Heinz; and Becker, Willi, to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH; and Teldix G.m.b.H. Bearing arrangement. 4,082,376, Cl. 308-10.000.

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Weinstein, Hyman; and Adler, Kurt, to Delta Truck Body Company, Inc. Fiberglass reinforced plywood structural sandwich with acrylic facing on one or both sides thereof. 4,082,882, Cl. 428-246.000.

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Weman, Per-Olof, to Sigmatex AG Basel. Safety belt for motor vehicles. 4,082,317, Cl. 280-745.000.

Wennerberg, Arnold N.; and O'Grady, Thomas M., to Standard Oil Company (Indiana). Active carbon process and composition. 4,082,694, Cl. 252-444.000.

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Wenthe, Stephen J., Jr.: *See—*
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Werner, Gregory Keith; Switzer, Kenneth Oscar; and St. Laurent, Raymond G., to Deere & Company. Support and guide for a track of a track-laying vehicle. 4,082,371, Cl. 305-56.000.

West Electric Company, Ltd.: *See—*
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Hayes, Matthew N., 4,082,931, Cl. 200-144.00C.
Jaklic, Albin, Jr.; and Stephens, Donald S., 4,082,916, Cl. 174-52.0PE.
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Mattern, John; and Harrison, Earnest R., 4,083,049, Cl. 343-7.700.
Morton, Edward W.; and Gilmore, John F., 4,082,981, Cl. 315-97.000.
Paice, Derek A., 4,083,001, Cl. 324-158.0MG.
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Whelan, James M., to University of Southern California. Process for the selective catalytic oxidation of partially oxidized inorganic compounds. 4,082,837, Cl. 423-405.000.

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Whittingham, Reginald P., to Walter Kidde & Company, Inc. Crane with left cylinder and journal lock and release device. 4,082,191, Cl. 212-59.00R.

Whittle, John Edward, to International Nickel Company, Inc., The. Production of perforated metal foil. 4,082,632, Cl. 204-129.650.

Whitworth, Billie J., to Hughes Tool Company. Cam mounting for an impact tool. 4,082,152, Cl. 173-119.000.

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Willey, Barry A. Motorcycle windshield assembly. 4,082,345, Cl. 296-78.100.

Williams, Charles V., to Southern Business Systems of Greensboro, Inc. Modular visitor station. 4,082,047, Cl. 109-21.500.

Williams, Frederick P., to Monarch Marking Systems, Inc. Switchproof label. 4,082,873, Cl. 428-40.000.

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Williams, Milton L.: *See—*
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Wilson, John S. Directional flare. 4,082,041, Cl. 102-35.000.

Wilson, Layton G.; and Ward, William, IV. Spillage collection device for fuel tanks for boats. 4,082,125, Cl. 141-86.000.

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Wilson, Richard C.: *See—*
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Winkles, Dwayne L. Land levelling equipment. 4,082,150, Cl. 172-780.000.

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Wise, Mark J., to Flexicore Co., Inc., The. Structural framework with improved connector. 4,081,936, Cl. 52-301.000.

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Wittenbrook, Lawrence S.; and Scheiderer, Edwin L., to D. M. Scott & Sons Company. Coated controlled-release product. 4,082,533, Cl. 71-28.000.

Wnek, Alfred B., to Ex-Cell-O Corporation. Handling system for heavy loads. 4,082,195, Cl. 214-38.0BA.

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Wolfe, Court Lone, to Chemed Corporation. Analytical cell assembly for an analyzer. 4,082,459, Cl. 356-85.000.

Wolff, Danny K.; Mott, James D.; and Colvin, Kenneth W., to Hydril Company. Method and apparatus for a surface control system for: subsurface safety valves. 4,082,147, Cl. 166-314.000.

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Wood, Edgar Wray; and Young, Jerry Olympus, to Smith International, Inc. Box hole drill steel. 4,082,323, Cl. 285-133.00A.

Wood, John Frederick Barry: *See*—
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Woodbury, John L., Jr. Water level control for toilet having vertical float. 4,082,110, Cl. 137-426.000.

Woodward, Oakley McDonald, to RCA Corporation. Circularly-polarized antenna system using tilted dipoles. 4,083,051, Cl. 343-797.000.

Woodward, William R. Multirudder steering system for multihull boats. 4,082,053, Cl. 114-163.000.

Wortham, Otis W.; and Sundstrom, John A., to General Motors Corporation. Clothes washer with centerpost mounted lint filter bag. 4,081,975, Cl. 68-18.0FA.

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Yamada, Muneki; Hirata, Sadao; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, to Toyo Seikan Kaisha Limited. Packaging materials having excellent gas permeation resistance and process for preparation thereof. 4,082,854, Cl. 426-106.000.

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Yamada, Yukio; Abe, Michiharu; and Oride, Akiyoshi, to Ricoh Co. Ltd. Method and apparatus for producing and fixing a visible image on a thermoplastic layer of a photoconductive material. 4,082,441, Cl. 355-14.000.

Yamahara, Takeshi; and Inokuma, Shun, to Sumitomo Chemical Company, Limited. Production of alpha-amino acids. 4,082,767, Cl. 260-326.14T.

Yamamoto, Hiroe; Takahashi, Noriyoshi; and Takahashi, Miyoshi, to Hitachi, Ltd. Gap winding type dynamo-electric machine. 4,082,974, Cl. 310-179.000.

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Yamashina, Toshiro; and Sakaki, Hirokazu, to Fuji Photo Film Co., Ltd. Lithographic printing plate. 4,082,040, Cl. 101-456.000.

Yamawaki, Takeshi; Hoshijima, Tokitaro; and Mizushima, Kiyoshi, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Method of tension stress testing of rubber. 4,081,994, Cl. 73-95.000.

Yanagihara, Shigeru, to Agency of Industrial Science & Technology. Automatic fuel heating injection valve. 4,082,067, Cl. 123-32.00H.

Yanez, Richard R., to Motorola, Inc. Semiconductor process. 4,082,604, Cl. 156-656.000.

Yang, Kei-Hsiung; and De Luca, John A., to General Electric Company. Tunable laser system. 4,083,018, Cl. 331-94.50F.

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Yenni, Donald McKelvie, to Union Carbide Corporation. Method for coating nonsymmetrical objects. 4,082,870, Cl. 427-425.000.

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Yoerger, William E., to Eastman Kodak Company. Hexachlorocyclopentene chemical sensitizers for heterogeneous organic photoconductive compositions. 4,082,550, Cl. 96-1.50R.

Yokogawa Electric Works, Ltd.: *See*—
Tada, Osamu; Nakagawa, Mutsuaki; Mori, Hiroshi; Wakasa, Yutaka; Kataoka, Koju; Inoue, Tadanari; and Uchiike, Hisayuki, 4,082,942, Cl. 364-111.000.

Yokohama Rubber Company, Limited, The: *See*—
Sugiyama, Yuichi; Kaido, Hiroyuki; and Koyama, Tsuneo, 4,082,909, Cl. 526-4.000.

Yokoshima, Ichiro, to Agency of Industrial Science & Technology. Loop type standard magnetic field generator. 4,083,006, Cl. 325-125.000.

Yokota, Akira; and Nakagawa, Yasuhiko, to Nissan Motor Company, Limited. Arrangement for supporting a thermal reactor to an engine proper. 4,081,959, Cl. 60-282.000.

Yokoyama, Masuo: *See*—
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Yoshida Kogyo K.K.: *See*—
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Yoshida, Motoaki, to Nippon Sheet Glass Co., Ltd. Polycarbonate resin shaped articles having improved abrasion resistance. 4,082,894, Cl. 428-335.000.

Yoshikawa, Masazi; and Sawada, Tomoe, to Murata Manufacturing Co., Ltd., a part interest. Spark plug cap providing a capacitor in parallel with the spark cap. 4,082,980, Cl. 315-59.000.

Yoshino Kogyosho Co., Ltd.: *See*—
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Young, Jerry Olympus: *See*—
Wood, Edgar Wray; and Young, Jerry Olympus, 4,082,323, Cl. 285-133.00A.

Youngdale, Gilbert A., to Upjohn Company, The. 2a,2b-Dihomo-15-alkyl $PGF_1\alpha$ analogs. 4,082,783, Cl. 260-410.90R.

Youngstown Sheet and Tube Company: *See*—
Lake, Peter B.; Grenawalt, John J.; and Pastorek, Ronald L., 4,082,576, Cl. 148-12.00F.

Yu, Rosendo U., to General Electric Company. Gate turnoff thyristor with a pilot SCR. 4,083,063, Cl. 357-38.000.

Zachary, William A., to International Minerals & Chemical Corporation. Combined sand core machine. 4,082,134, Cl. 164-157.000.

Zahler, Wolf-Dieter: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Zahler, Wolf-Dieter; and Grimm-Lenz, Rainer, 4,082,722, Cl. 260-42.430.

Zakharov, Nikolai Nikolaevich; and Paramonov, Evgeny Borisovich. Regulating systems for two-shaft gas-turbine engine. 4,081,955, Cl. 60-39.16S.

Zangrando, Donald Roy; and Kelley, Clifford Herrol, Jr., to Varian Associates, Inc. Coupled-cavity microwave oscillator. 4,083,016, Cl. 331-56.000.

Zanko, George Michael: *See*—
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Zardi, Umberto; Lagana', Vincenzo; Bonetti, Andrea; and Schmid, Giorgio, to Snamprogetti, S.p.A. Method for the condensation of carbammate in urea-synthesis installations. 4,082,797, Cl. 260-555.00A.

Zboril, Vaclav George, to du Pont of Canada Limited. Paper-like thermoplastic film. 4,082,880, Cl. 428-220.000.

Zeineh, Rashid Ayoub; and Finley, Richard Arthur. Ultra filtration apparatus and method. 4,082,668, Cl. 210-129.000.

Zeitler, Karl-Heinz: *See*—
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Andrascheck, Hans-Joachim; Lorcher, Otfried; and Zentner, Erich, 4,082,711, Cl. 260-23.0XA.

Zharinov, Valery Ivanovich: *See*—
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Zinnes, Harold: *See*—
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Zirngiebl, Eberhard, to Bayer Aktiengesellschaft. Absorption of chlorine gas. 4,082,631, Cl. 204-128.000.

Zollar, Leland H.; and Moore, Edward W., to Harvest Industries, Inc. Dried phosphoric acid product and process. 4,082,677, Cl. 252-8.50B.

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Zulli, Bruno. Method for producing thin particle board. 4,082,828, Cl. 264-119.000.

Zwiep, Theodore Carl; Newhouse, Donn G.; and Craner, Jerry D., to Country Queen Foods, Inc. Process and apparatus for shelling eggs. 4,082,856, Cl. 426-299.000.

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LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Berger, Horst H.; and Wiedmann, Siegfried K., to International Business Machines Corporation. Monolithically integrated semiconductor structure containing at least two devices in a common zone and technique for preventing parasitic transistor action. T969,010, 4-4-78, Cl. 357-46.000.

Cogswell, Frederic Neil; and Tomka, Jiri George, to Imperial Chemical Industries Limited. Production of oriented fibrillar products. T969,008, 4-4-78, Cl. 260-78.410.

Davis, Merton Louis; and Dworjanyn, Lee Oleh. Dyed fibers. T969,001, 4-4-78, Cl. 8-25.000.

Dworjanyn, Lee Oleh: *See*—
Davis, Merton Louis; and Dworjanyn, Lee Oleh, T969,001, Cl. 8-25.000.

General Electric Company: *See*—
Lahut, Joseph A.; and Skoda, Raymond E., T969,009, Cl. 346-74.100.

Goetz, Richard E., to Smith International, Inc. Method for making rock bits. T969,007, 4-4-78, Cl. 219-121.0EM.

Imperial Chemical Industries Limited: *See*—
Cogswell, Frederic Neil; and Tomka, Jiri George, T969,008, Cl. 260-78.410.
Watkiss, Bruce Martin, T969,004, Cl. 96-27.00R.

International Business Machines Corporation: *See*—
Berger, Horst H.; and Wiedmann, Siegfried K., T969,010, Cl. 357-46.000.

Kohler, John J.: *See*—
Phillips, John F., Jr.; and Kohler, John J., T969,003, Cl. 71-64.00F.

Lahut, Joseph A.; and Skoda, Raymond E., to General Electric Company. Transfer of magnetic toner particles with a directed magnetic field. T969,009, 4-4-78, Cl. 346-74.100.

Mihara, Yuji: *See*—
Tanaka, Akira; Mikawa, Akikazu; Mihara, Yuji; and Mukunoki, Yasuo, T969,005, Cl. 96-100.00R.

Mihari, Yuji; Sakai, Takeo; Ohmatsu, Hideki; and Sato, Akira. Spectrally sensitized silver halide photographic emulsions. T969,006, 4-4-78, Cl. 96-126.000.

Mikawa, Akikazu: *See*—
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Tanaka, Akira; Mikawa, Akikazu; Mihara, Yuji; and Mukunoki, Yasuo, T969,005, Cl. 96-100.00R.

Norton, Melvin M.; and Parker, Byron R., to Tennessee Valley Authority. Granular ammonium phosphate sulfate and urea-ammonium phosphate sulfate using a common pipe-cross reactor. T969,002, 4-4-78, Cl. 71-29.000.

Ohmatsu, Hideki: *See*—
Mihari, Yuji; Sakai, Takeo; Ohmatsu, Hideki; and Sato, Akira, T969,006, Cl. 96-126.000.

Parker, Byron R.: *See*—
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Phillips, John F., Jr.; and Kohler, John J., to Tennessee Valley Authority. Controlled release liquid fertilizers. T969,003, 4-4-78, Cl. 71-64.00F.

Sakai, Takeo: *See*—
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Smith International, Inc.: *See*—
Goetz, Richard E., T969,007, Cl. 219-121.0EM.

Tanaka, Akira; Mikawa, Akikazu; Mihara, Yuji; and Mukunoki, Yasuo. Color photographic materials containing high-boiling organic solvent. T969,005, 4-4-78, Cl. 96-100.00R.

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Vermeire, Hans F., to Shell Oil Company. Hot melt adhesive emulsion process. T969,011, 4-4-78, Cl. 427-207.00B.

Watkiss, Bruce Martin, to Imperial Chemical Industries Limited. Light-absorbing filters. T969,004, 4-4-78, Cl. 96-27.00R.

Wiedmann, Siegfried K.: *See*—
Berger, Horst H.; and Wiedmann, Siegfried K., T969,010, Cl. 357-46.000.

LIST OF REISSUE PATENTEES

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Caterpillar Tractor Co.: *See*—
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Continental Oil Company: *See*—
Ziegenhain, William C.; and Smith, John H., Re. 29,605, Cl. 23-293.00A.

Eaton Corporation: *See*—
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Matarelli, Frank W. Whip finishing tool. Re. 29,604, Cl. 289-17.000.

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Perl, Richard L., to Tappan Company, The. Domestic oven. Re. 29,602, Cl. 126-21.00A.

Richards, Elmer A., to Eaton Corporation. Transmission with resiliently loaded mainshaft gears. Re. 29,601, Cl. 74-339.000.

Shankwitz, Robert F.: *See*—
Oke, Stanley A.; and Shankwitz, Robert F., Re. 29,603, Cl. 214-145.00R.

Smith, John H.: *See*—
Ziegenhain, William C.; and Smith, John H., Re. 29,605, Cl. 23-293.00A.

Tappan Company, The: *See*—
Perl, Richard L., Re. 29,602, Cl. 126-21.00A.

Ziegenhain, William C.; and Smith, John H., to Continental Oil Company. High-porosity, high-surface area, low-bulk density alumina. Re. 29,605, Cl. 23-293.00A.

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Cross, Harry, Jr., to Gray, O. S., Jr. Pecan tree named GraCross. 4,236, 4-4-78, Cl. 31.000.

Ecke, Paul, Jr.: *See—*
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Friedman, Cora G.: *See—*
Friedman, Martin; and Friedman, Cora G., 4,232, Cl. 38.000.

Friedman, Martin; and Friedman, Cora G. French prune. 4,232, 4-4-78, Cl. 38.000.

Gray, O. S., Jr.: *See—*
Cross, Harry, Jr., 4,236, Cl. 31.000.

Gutbier, Gregor, to Ecke, Paul, Jr. Poinsettia plant named Gutbier V-10. 4,235, 4-4-78, Cl. 68.000.

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Klehm, Roy G., to Klehm Boys' Partnership. Peony plant named My Pal Rudy. 4,233, 4-4-78, Cl. 68.000.

Klehm, Roy G., to Klehm Boys' Partnership. Peony named whopper. 4,234, 4-4-78, Cl. 68.000.

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AB Filip Linden: *See—*
Breger, Carl Arne, 247,664, Cl. D10-101.000.

Balmer, James G., Jr., to Xerox Corporation. Film reel. 247,667, 4-4-78, Cl. D14-11.000.

Behun, Eugene, to Xerox Corporation. Stripper pad. 247,673, 4-4-78, Cl. D16-32.000.

Behun, Eugene, to Xerox Corporation. Stripper pad. 247,674, 4-4-78, Cl. D16-32.000.

Behun, Eugene, to Xerox Corporation. Stripper pad. 247,675, 4-4-78, Cl. D16-32.000.

Berkey-Colortran, Inc: *See—*
LeVasseur, Craig, 247,689, Cl. D48-20.00K.

Blackman, R. Eugene: *See—*
Laule, Thomas M.; Parise, Carl; Wimsatt, James M.; and Blackman, R. Eugene, 247,671, Cl. D15-52.000.

Bockhorn, Albert. Crab trap. 247,677, 4-4-78, Cl. D22-18.000.

Breger, Carl Arne, to AB Filip Linden. Rain gauge. 247,664, 4-4-78, Cl. D10-101.000.

Brokaw, Paul E. Fish lure. 247,678, 4-4-78, Cl. D22-27.000.

Brown, Paul R., to United States Telephone Company. Telephone or similar article. 247,670, 4-4-78, Cl. D14-53.000.

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Nakao, Shinroku; and Ishii, Yoshiyasu, 247,688, Cl. D34-15.00C.

Dartois, Yvon Maurice, to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes. Tire. 247,666, 4-4-78, Cl. D12-146.000.

Desjardins, Adrien. Tool for golf player. 247,686, 4-4-78, Cl. D34-5.0CB.

Dillon, Jack E.: *See—*
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Doyel, John S. Record cleaning device. 247,662, 4-4-78, Cl. D7-161.000.

Dunlop Limited: *See—*
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Furst, Norman Roland; and Tokiyama, Masaru, to Motorola, Inc. Housing for a microphone or similar article. 247,668, 4-4-78, Cl. D14-12.000.

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Haines, Robert Christopher; and Shaw, Michael, to Dunlop Limited. Golf ball. 247,685, 4-4-78, Cl. D34-5.0QQ.

Hemphill, William T. Douche apparatus. 247,681, 4-4-78, Cl. D24-61.000.

Ishii, Yoshiyasu: *See—*
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Kruse, James Allen. Grinding wheel. 247,672, 4-4-78, Cl. D15-126.000.

Larsen, Larry D., to Patent Development & Management Company. Fire alarm housing. 247,665, 4-4-78, Cl. D10-121.000.

Laule, Thomas M.; Parise, Carl; Wimsatt, James M.; and Blackman, R. Eugene, to Parise & Sons, Inc. Hot-water extraction unit. 247,671, 4-4-78, Cl. D15-52.000.

LeVasseur, Craig, to Berkey-Colortran, Inc. Luminaire. 247,689, 4-4-78, Cl. D48-20.00K.

Lighting Systems, Inc.: *See—*
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Marusho Industrial Co., Ltd.: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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McMullen, Thomas J. Spray gun handle. 247,679, 4-4-78, Cl. D23-17.000.

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Murakami, Tsutomu; and Mishiro, Benito, 247,669, Cl. D14-12.000.

Motorola, Inc.: *See—*
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Murakami, Tsutomu; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Combined transceiver remote-control microphone. 247,669, 4-4-78, Cl. D14-12.000.

Nakahata, Kozo, to Marusho Industrial Co., Ltd. Splicer. 247,676, 4-4-78, Cl. D16-41.000.

Nakao, Shinroku; and Ishii, Yoshiyasu, to Combi Co., Ltd. Toy music box. 247,688, 4-4-78, Cl. D34-15.00C.

Nitta, Tomio. Disposable cigarette gas lighter. 247,682, 4-4-78, Cl. D27-42.000.

North American Philips Corporation: *See—*
Rakocy, William J.; and Tsuji, Masao, 247,683, Cl. D28-13.000.

Parise, Carl: *See—*
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Rakocy, William J.; and Tsuji, Masao, to North American Philips Corporation. Electric hair dryer. 247,683, 4-4-78, Cl. D28-13.000.

Richard Heinze GmbH & Co. KG, Firma: *See—*
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Roland, Bernadette C. Headgear toy for hoop whirling or the like. 247,687, 4-4-78, Cl. D34-5.0HP.

Selchow & Righter Company: *See—*
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Spellier, Roland, to Richard Heinze GmbH & Co. KG, Firma. Handle for furniture doors, drawers or the like. 247,663, 4-4-78, Cl. D8-313.000.

Tiffany, Lee W., to Selchow & Righter Company. Score sheet. 247,684, 4-4-78, Cl. D34-5.0MM.

Tokiyama, Masaru: *See—*
Furst, Norman Roland; and Tokiyama, Masaru, 247,668, Cl. D14-12.000.

Tortorici, Michael A. Wine rack. 247,660, 4-4-78, Cl. D7-71.000.

Tsuji, Masao: *See—*
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United States Shoe Corporation: *See—*
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Wimsatt, James M.: *See—*
Laule, Thomas M.; Parise, Carl; Wimsatt, James M.; and Blackman, R. Eugene, 247,671, Cl. D15-52.000.

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York, Harold D., Jr. Thong sandal. 247,657, 4-4-78, Cl. D2-270.000.

Zelina, Thomas, to Lighting Systems, Inc. Combined portable fluorescent light and power pack therefor. 247,690, 4-4-78, Cl. D48-24.00R.

CLASSIFICATION OF PATENTS

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386 4,081,961
501 4,081,962
528 4,081,963
636 4,081,964
641 4,081,965
4,081,966
4,081,967

CLASS 61

35 4,081,968
39 4,081,969
88 4,081,970

CLASS 62

216 4,081,971

CLASS 63

31 4,081,972

CLASS 65

24 4,082,526
83 4,082,527
135 4,082,528
273 4,082,529
4,082,530
296 4,082,531

CLASS 66

64 4,081,973
75.2 4,081,974

CLASS 68

18 FA 4,081,975
19 4,081,976

CLASS 69

42 4,081,977

CLASS 70

58 4,081,978
4,081,979
92 4,081,980

CLASS 71

8 4,082,532
28 4,082,533
92 4,082,534
4,082,535
93 4,082,536
121 4,082,537
125 4,082,538

CLASS 72

49 4,081,981
56 4,081,982
4,081,983
60 4,081,984
117 4,081,985
320 4,081,986
389 4,081,987

CLASS 73

4 R 4,081,988
9 4,081,989
40.5 R 4,081,990
41 4,081,991
84 4,081,992
88 R 4,081,993
95 4,081,994
116 4,081,995
141 A 4,081,996
168 4,081,997
302 4,081,998
343 R 4,081,999
358 4,082,000
422 R 4,082,003
4,082,004
505 4,082,005
756 4,082,001
4,082,002

CLASS 74

89.2 4,082,006
240 4,082,007
339 Re.29,601
531 4,082,008
731 4,082,009
800 4,082,010
862 4,082,011
864 4,082,012
866 4,082,013

CLASS 75

3 4,082,539
4,082,540
5 4,082,541
4,082,542
11 4,082,543
12 4,082,544
35 4,082,545
109 4,082,546
122.7 4,082,547
171 4,082,548

CLASS 76

43 4,082,014
108 A 4,082,015

CLASS 81

3.43 4,082,016
57.16 4,082,017

CLASS 82

2.5 4,082,018
36 A 4,082,019
37 4,082,020

CLASS 83

4 4,082,021
82 4,082,022
293 4,082,023
402 4,082,024
411 R 4,082,025
453 4,082,026

CLASS 84

1.01 4,082,027
1.24 4,082,028
484 4,082,029

CLASS 85

80 4,082,030

CLASS 90

4 4,082,031

CLASS 91

216 B 4,082,032

CLASS 96

1 PC 4,082,551
1 R 4,082,549
1.5 R 4,082,550
38.4 4,082,552
74 4,082,553
101 4,082,554
114.1 4,082,555
115 R 4,082,556

CLASS 99

406 4,082,033

CLASS 100

240 4,082,034

CLASS 101

93.04 4,082,035
122 4,082,036
425 4,082,037
4,082,038
450 4,082,039
456 4,082,040

CLASS 102

35 4,082,041

CLASS 104

18 4,082,042

CLASS 105

182 R 4,082,043
376 4,082,044
411 4,082,045

CLASS 106

1.11 4,082,557
10 4,082,558
43 4,082,559
45 4,082,560
89 4,082,561
90 4,082,563
97 4,082,562

CLASS 108

106 4,082,046

CLASS 109

21.5 4,082,047

CLASS 111

2 4,082,048

CLASS 114

39 4,082,049
53 4,082,050
72 4,082,051
75 4,082,052
163 4,082,053
230 4,082,054
245 4,082,055

CLASS 116

34 R 4,082,056

CLASS 118

9 4,082,057
319 4,082,058
407 4,082,059
411 4,082,060
645 4,082,061

CLASS 119

5 4,082,062
4,082,063
51.11 4,082,064

CLASS 123

32 EA 4,082,066
32 H 4,082,067
41.02 4,082,068
117 D 4,082,069
119 B 4,082,071
119 E 4,082,070
139 AA 4,082,072
140 FG 4,082,074
140 R 4,082,073
148 E 4,082,075
219 4,082,065

CLASS 124

7 4,082,076

CLASS 126

21 A Re.29,602
197 4,082,077
4,082,078
270 4,082,079
271 4,082,080
4,082,081
4,082,082
343.5 A 4,082,083

CLASS 127

46 A 4,082,564

CLASS 128

2 D 4,082,084
2 G 4,082,085
2.06 E 4,082,086
4,082,087
2.08 4,082,088
24.3 4,082,089
51 4,082,090
66 4,082,091
139 4,082,092
142.2 4,082,093
214 R 4,082,094
235 4,082,095
303.1 4,082,096
419 PS 4,082,097

CLASS 131

9 4,082,098

CLASS 133

3 R 4,082,099

CLASS 134

1 4,082,565
2 4,082,566
10 4,082,567
76 4,082,100
127 4,082,101

CLASS 135

5 R 4,082,102

CLASS 136

89 CC 4,082,568
4,082,569
89 SJ 4,082,570

CLASS 137

54 4,082,103
71 4,082,104
72 4,082,105
174 4,082,106
195 4,082,107
269.5 4,082,108
322 4,082,993
340 4,082,109
426 4,082,110
596 4,082,111
614.03 4,082,112
624.11 4,082,113
625.37 4,082,114
630.14 4,082,116
630.2 4,082,115
870 4,082,117

CLASS 139

144 4,082,118
370.2 4,082,119

CLASS 140

107 4,082,120

CLASS 141

5 4,082,122
27 4,082,121
64 4,082,123
65 4,082,124
86 4,082,125

CLASS 142

1 4,082,126

CLASS 144

220 4,082,127
230 4,082,128
326 R 4,082,129

CLASS 148

1.5 4,082,571
4,082,572
2 4,082,573
4,082,574
6.35 4,082,575
12 F 4,082,576
12.1 4,082,577
12.7 A 4,082,578
31.55 4,082,579
4,082,580
32 4,082,581
102 4,082,582

CLASS 149

96 4,082,583
109.4 4,082,584

CLASS 151

23 4,082,130

CLASS 152

210 4,082,131
361 R 4,082,132

CLASS 156

51 4,082,585
61 4,082,586
71 4,082,587
4,082,588
98 4,082,589
144 4,082,590
150 4,082,591
153 4,082,592
230 4,082,593
253 4,082,594
351 4,082,595
359 4,082,596
429 4,082,597
463 4,082,598
504 4,082,599
505 4,082,600
623 R 4,082,601
627 4,082,602
654 4,082,603

656 4,082,604
4,082,605

CLASS 159

27 B 4,082,606

CLASS 160

191 4,082,133

CLASS 164

157 4,082,134
404 4,082,135
433 4,082,136

CLASS 165

1 4,082,137
4 4,082,138
8 4,082,139
45 4,082,140
69 4,082,141
76 4,082,142
104 S 4,082,143

CLASS 166

250 4,082,144
251 4,082,145
259 4,082,146
314 4,082,147

CLASS 169

61 4,082,148

CLASS 172

40 4,082,149
780 4,082,150

CLASS 173

119 4,082,151
4,082,152

CLASS 174

51 4,082,915
52 PE 4,082,916
146 4,082,917

CLASS 176

19 LD 4,082,607
61 4,082,608
86 R 4,082,609
365 4,082,610

CLASS 177

177 4,082,153
211 4,082,154

CLASS 179

1 AA 4,082,918
2 A 4,082,921
2 DP 4,082,920
2 EA 4,082,919
15 BA 4,082,922
18 GF 4,082,923
84 VF 4,082,924

CLASS 180

5 R 4,082,155
9.62 4,082,156
14 A 4,082,157
108 4,082,158

CLASS 181

156 4,082,159
258 4,082,160

CLASS 182

82 4,082,161
166 4,082,162

CLASS 184

105 R 4,082,163

CLASS 187

29 R 4,082,164

CLASS 188

59 4,082,165
73.6 4,082,166
4,082,167
112 R 4,082,168
322 4,082,169

CLASS 192

13 R 4,082,170
70.2 4,082,171

CLASS 195

28 R 4,082,611
62 4,082,612
76 4,082,613
139 4,082,614

CLASS 197

20 4,082,172

CLASS 198

330 4,082,173
368 4,082,174
377 4,082,175
411 4,082,176
453 4,082,177
741 4,082,178
801 4,082,179
835 4,082,180
863 4,082,181

CLASS 200

11 G 4,082,925
19 DR 4,082,926
52 R 4,082,927
67 DA 4,082,928
83 SA 4,082,929
84 C 4,082,930
144 C 4,082,931
148 R 4,082,932
163 4,082,933
315 4,082,934

CLASS 201

12 4,082,615

CLASS 203

3 4,082,616
28 4,082,617

CLASS 204

15 4,082,618
4,082,619
4,082,620
38 B 4,082,621
40 4,082,622
43 S 4,082,623
47 4,082,624
4,082,625
56 R 4,082,626
59 R 4,082,627
64 T 4,082,628
66 4,082,629
128 4,082,631
129.65 4,082,632
157.1 R 4,082,633
159.15 4,082,634
159.23 4,082,635
192 E 4,082,637
192 N 4,082,636
213 4,082,638
219 4,082,639
279 4,082,640
281 4,082,641
299 EC 4,082,642

CLASS 205

98 4,082,630

CLASS 206

107 4,082,182
301 4,082,183
519 4,082,184
525 4,082,185
577 4,082,186
585 4,082,187

CLASS 208

8 4,082,643
4,082,644
11 R 4,082,645
4,082,646
78 4,082,647
97 4,082,648
111 4,082,649
131 4,082,650
139 4,082,651
216 4,082,652
251 R 4,082,653
352 4,082,654

CLASS 209

73 4,082,188
4,082,189
173 4,082,655
222 4,082,656
311 4,082,657

CLASS 210

22 R 4,082,658
23 F 4,082,659
36 4,082,660
40 4,082,661
63 R 4,082,662
79 4,082,663
80 4,082,664
91 4,082,665
93 4,082,666
96 M 4,082,667
129 4,082,668
184 4,082,669
195 R 4,082,670
195 S 4,082,671
205 4,082,672
234 4,082,673
242 S 4,082,674
360 R 4,082,675
447 4,082,676

CLASS 211

11 4,082,190

CLASS 212

59 R 4,082,191

CLASS 214

1 HA 4,082,192
2.5 4,082,193
6 P 4,082,194
38 BA 4,082,195
83.22 4,082,196
132 4,082,197
145 R Re.29,603
519 4,082,198
672 4,082,199

CLASS 215

1 C 4,082,200

CLASS 219

9.5 4,082,935
10.41 4,082,936
121 EB 4,082,937
4,082,938
202 4,082,939
239 4,082,940
243 4,082,941

CLASS 220

339 4,082,201

CLASS 221

147 4,082,202
211 4,082,203

CLASS 222

191 4,082,204
193 4,082,205
400.7 4,082,206
594 4,082,207

CLASS 224

8 R 4,082,208
29 B 4,082,209

CLASS 226

91 4,082,210

CLASS 228

145 4,082,211
147 4,082,212
171 4,082,213

CLASS 229

23 R 4,082,214
36 4,082,215
55 4,082,216

CLASS 233

25 4,082,217

CLASS 235

303.1 4,082,943
304 4,082,218
309 4,082,944
419 4,082,945

CLASS 236

12 R 4,082,219

CLASS 238

10 F 4,082,220

CLASS 239

214.25 4,082,221
331 4,082,222
333 4,082,223
428.5 4,082,225
453 4,082,224
584 4,082,226
675 4,082,227

CLASS 241

34 4,082,228
46 B 4,082,229
92 4,082,230
187 4,082,231
236 4,082,232
244 4,082,233
248 4,082,234

CLASS 242

84.2 J 4,082,235
107.4 B 4,082,236
192 4,082,237

CLASS 244

17.13 4,082,238
98 4,082,239
158 4,082,240

CLASS 248

1 4,082,241
83 4,082,242
205 R 4,082,243
280 4,082,244

CLASS 249

68 4,082,245

CLASS 250

203 R 4,082,947
304 4,082,948
329 4,082,949
336 4,082,951
343 4,082,950
381 4,082,952
413 4,082,953
421 4,082,954
445 T 4,082,955
480 4,082,956
482 4,082,957
492 B 4,082,958
577 4,082,959

CLASS 251

229 4,082,247
307 4,082,246

CLASS 252

8.5 B 4,082,677
8.6 4,082,678
8.8 4,082,679
59 4,082,680
62.1 P 4,082,681
92 4,082,682
105 4,082,683
109 4,082,684
187 R 4,082,685
299 4,082,686
301.4 F 4,082,687
316 4,082,688
321 4,082,689
4,082,690
358 4,082,691
429 B 4,082,692
430 4,082,693
444 4,082,694
465 4,082,695
466 B 4,082,696
466 PT 4,082,697
469 4,082,698
472 4,082,699

CLASS 254

29 R 4,082,248
45 4,082,249
47 4,082,250

CLASS 260

2 A 4,082,700
2.1 E 4,082,701
2.5 A 4,082,704
2.5 AK 4,082,702
2.5 BE 4,082,703
4 R 4,082,705
5 4,082,706
18 N 4,082,708
22 CB 4,082,709
23 TN 4,082,710
23 X A 4,082,711
28 R 4,082,712
29.3 4,082,713
29.7 R 4,082,714
30.4 R 4,082,716
30.6 R 4,082,715
33.4 R 4,082,718
37 SB 4,082,719
42.15 4,082,720
42.21 4,082,721
42.43 4,082,722
45.75 B 4,082,724
4,082,725
45.8 N 4,082,723
46.5 G 4,082,727
46.5 UA 4,082,726
67 A 4,082,728
67 FP 4,082,729
72 R 4,082,730
75 T 4,082,731
112 B 4,082,732
4,082,733
112.5 R 4,082,734
4,082,735
4,082,736
4,082,737
121 4,082,738
146 R 4,082,740
146 T 4,082,739
154 4,082,741
187 4,082,742
239 BB 4,082,744
239.1 4,082,745
239.57 4,082,747
239.9 4,082,746
250 BN 4,082,749
250 Q 4,082,750
256.4 C 4,082,751
260 4,082,752
285.5 4,082,753
287 P 4,082,754
293.53 4,082,756
293.6 4,082,755
294.8 C 4,082,757
294.8 E 4,082,759
294.8 F 4,082,758
307 FA 4,082,760
308 C 4,082,765
308 R 4,082,761
4,082,762
4,082,763
4,082,764
326 HL 4,082,766
326.14 T 4,082,767
326.26 4,082,768
328 4,082,769
330.5 4,082,770
332.2 R 4,082,771
332.3 H 4,082,772
340.5 4,082,774
340.5 R 4,082,773
343.6 4,082,775
4,082,776
345.9 R 4,082,717
348.25 4,082,777
378 4,082,778
397.5 4,082,779
4,082,780
403 4,082,781
408 4,082,782
410.9 R 4,082,783
413 4,082,784
448.8 R 4,082,790
453 P 4,082,787
465 C 4,082,786
465.3 4,082,785
465.4 4,082,788
500.5 H 4,082,707
501.11 4,082,792
502.4 R 4,082,793
514 D 4,082,794
544 F 4,082,795
545 R 4,082,796
555 A 4,082,797
557 B 4,082,798
559 B 4,082,799
4,082,800
570.9 4,082,801
574 4,082,802
575 4,082,803
584 R 4,082,804
585 B 4,082,805
590 D 4,082,806
590 R 4,082,807
606.5 B 4,082,810
4,082,811
609 F 4,082,808
610 R 4,082,812
611 R 4,082,809
618 B 4,082,813
619 R 4,082,814
683.2 4,082,815
855 4,082,816
879 4,082,817
4,082,818
4,082,819
4,082,820
946 4,082,821
972 4,082,822

CLASS 264

7 4,082,823
46.3 4,082,824
46.5 4,082,825
65 4,082,826
98 4,082,827
119 4,082,828
209 4,082,829
213 4,082,830
249 4,082,831

CLASS 266

142 4,082,252
147 4,082,253
175 4,082,254

CLASS 267

64 R 4,082,255
81 4,082,256

CLASS 269

328 4,082,257

CLASS 270

31 4,082,258
73 4,082,259

CLASS 271

1 4,082,260
69 4,082,261
149 4,082,262
266 4,082,263

CLASS 272

73 4,082,264
4,082,265
75 4,082,266
125 4,082,267

CLASS 273

1 R 4,082,268
1.5 R 4,082,269
2 4,082,270
29 A 4,082,271
73 A 4,082,272
73 C 4,082,274
73 D 4,082,275
73 J 4,082,273
75 4,082,276
80 R 4,082,277
94 R 4,082,278
102 B 4,082,280
106 A 4,082,281
126 R 4,082,282
162 B 4,082,286
186 C 4,082,287
218 4,082,288
237 4,082,285
241 4,082,283
246 4,082,289
251 4,082,284
272 4,082,279

CLASS 274

9 A 4,082,290
23 R 4,082,291
4,082,292
39 A 4,082,293
47 4,082,294

CLASS 277

1 4,082,295
3 4,082,296
15 4,082,297
34.3 4,082,298
82 4,082,299
123 4,082,300
212 F 4,082,301

CLASS 280

11.37 H 4,082,302
4,082,303
12 KL 4,082,304
81 R 4,082,305
87.04 A 4,082,306
277 4,082,307
296 4,082,308
446 B 4,082,309
492 4,082,310
507 4,082,311
615 4,082,312
618 4,082,313
625 4,082,314
631 4,082,315
681 4,082,316
745 4,082,317

CLASS 285

19 4,082,318
27 4,082,319
31 4,082,320
39 4,082,321
133 A 4,082,323
133 R 4,082,322
137 R 4,082,324
155 4,082,325
238 4,082,326
401 4,082,327

CLASS 289

2 4,082,328
17 Re.29,604

CLASS 292

202 4,082,329
218 4,082,330
228 4,082,331
259 R 4,082,332
264 4,082,333
288 4,082,334
291 4,082,335
318 4,082,336
338 4,082,337

CLASS 293

85 4,082,338

CLASS 294

1 CA 4,082,339

CLASS 296

1 S 4,082,340
4,082,341
28 C 4,082,342
4,082,343
4,082,344
78.1 4,082,345
84 R 4,082,346
98 4,082,347

CLASS 297

45 4,082,348
183 4,082,349
243 4,082,350
347 4,082,351
364 4,082,352
379 4,082,353
410 4,082,354
440 4,082,355
442 4,082,356

CLASS 298

27 4,082,357

CLASS 299

4 4,082,358
4,082,359
33 4,082,360
43 4,082,361
57 4,082,362

CLASS 301

6 CS 4,082,363

CLASS 302

11 4,082,366
14 4,082,367
4,082,368
28 4,082,364
52 4,082,365

CLASS 303

3 4,082,369
92 4,082,370

CLASS 305

56 4,082,371
57 4,082,372

CLASS 307

118 4,082,960
141 4,082,961
147 4,082,962
221 D 4,082,963
259 4,082,964
260 4,082,965
362 4,082,966

CLASS 308

4 A 4,082,373
6 C 4,082,374
9 4,082,375
10 4,082,376
15 4,082,377
4,082,378
26 4,082,379
163 4,082,380
187 4,082,381
190 4,082,382
194 4,082,383

CLASS 310

64 4,082,967
68 B 4,082,968
103 4,082,969
113 4,082,970
114 4,082,971
162 4,082,972
4,082,973
179 4,082,974
239 4,082,975

CLASS 312

3 4,082,384
10 4,082,385
204 4,082,386
242 4,082,387
258 4,082,388
4,082,389
284 4,082,390
314 4,082,391

CLASS 313

135 4,082,976
457 4,082,977
474 4,082,978

CLASS 315

39.3 4,082,979
59 4,082,980
97 4,082,981
151 4,082,982
241 P 4,082,983
4,082,984
4,082,985
411 4,082,986

CLASS 316

19 4,082,392

CLASS 318

139 4,082,987
4,082,988
224 A 4,082,989
662 4,082,990

CLASS 320

1 4,082,991
6 4,082,992

CLASS 324

30 R 4,082,994
51 4,082,995
65 R 4,082,997
99 D 4,082,998
116 4,082,999
137 4,083,000
158 MG 4,083,001
227 4,083,002

CLASS 325

6 4,083,003
4,083,004
38 A 4,083,005
125 4,083,006
159 4,083,007
163 4,083,008
304 4,083,009
321 4,083,010
352 4,083,011
455 4,083,012

CLASS 328

207 4,083,013

CLASS 331

1 A 4,083,014
4 4,083,015
56 4,083,016
94.5 F 4,083,018
94.5 H 4,083,017
113 R 4,083,019
4,083,020

CLASS 333

72 4,083,021
79 4,083,022

CLASS 335

135 4,083,023
136 4,083,024
153 4,083,025

CLASS 336

70 4,083,026

CLASS 337

66 4,083,027
144 4,083,028

CLASS 338

32 S 4,083,029
35 4,083,030

CLASS 339

14 R 4,082,393
17 M 4,082,394
21 R 4,082,395
36 4,082,396
49 R 4,082,397
59 M 4,082,398
75 M 4,082,399
91 R 4,082,400
95 B 4,082,401
97 C 4,082,402
111 4,082,403
4,082,404
4,082,405
112 L 4,082,406
112 R 4,082,407
182 R 4,082,409
198 G 4,082,408
252 R 4,082,410
4,082,411
256 SP 4,082,412

CLASS 340

5 R 4,083,031
71 4,083,032
114 R 4,083,033
146.3 E 4,083,035
146.3 H 4,083,034
166 R 4,083,036
237 S 4,083,037
244 R 4,083,038
248 A 4,083,040
248 R 4,083,039
255 4,083,041
324 M 4,083,042
347 AD 4,083,043
4,083,044
4,083,045

CLASS 343

7 VM 4,083,047
7.3 4,083,048
7.7 4,083,049
700 MS 4,083,046
729 4,083,050
797 4,083,051

CLASS 346

18 4,083,052
75 4,083,053
151 4,083,054

CLASS 350

1.1 4,082,413
1.7 4,082,414
3.83 4,082,415
6.8 4,082,416
4,082,417
10 4,082,418
96.11 4,082,424
96.12 4,082,419
96.17 4,082,425
96.22 4,082,421
96.23 4,082,422
4,082,423
96.31 4,082,420
105 4,082,426
4,082,427
162 SF 4,082,429
4,082,431
174 4,082,432
211 4,082,433
225 4,082,434
269 4,082,435
333 4,082,430
350 4,082,428

CLASS 352

72 4,082,436
123 4,082,437

CLASS 353

26 R 4,082,440
97 4,082,438

CLASS 354

23 D 4,083,055
25 4,083,056
4,083,057
128 4,083,058
149 4,083,059
286 4,083,060
307 4,083,061

CLASS 355

3 R 4,082,442
3 SC 4,082,448
4 4,082,443
8 4,082,444
14 4,082,441
4,082,445
27 4,082,446
30 4,082,447
69 4,082,449
71 4,082,450
4,082,451
74 4,082,452
88 4,082,453
99 4,082,454
100 4,082,439
4,082,455
109 4,082,456

CLASS 356

39 4,082,457
73 4,082,458
85 4,082,459
4,082,460
100 4,082,461
152 4,082,462
167 4,082,463
188 4,082,464
203 4,082,465
249 4,082,466

CLASS 357

13 4,083,062
38 4,083,063

CLASS 358

242 4,082,996

CLASS 362

32 4,082,946

CLASS 364

111 4,082,942

CLASS 366

179 4,082,251

CLASS 401

199 4,082,467

CLASS 403

2 4,082,468
24 4,082,469
172 4,082,470

CLASS 404

133 4,082,471

CLASS 408

57 4,082,472
101 4,082,473
110 4,082,474
125 4,082,475
234 4,082,476

CLASS 415

120 4,082,477
209 4,082,478

CLASS 416

23 4,082,479

CLASS 417

283 4,082,480
403 4,082,481
408 4,082,482
554 4,082,483

CLASS 418

55 4,082,484
226 4,082,485

CLASS 423

70 4,082,832
135 4,082,833
210 4,082,834
242 4,082,835
321 S 4,082,836
405 4,082,837
408 4,082,838
489 4,082,839

CLASS 424

1 4,082,840
50 4,082,841
229 4,082,842
241 4,082,881
250 4,082,843
4,082,844
4,082,845
266 4,082,846
273 4,082,848
273 R 4,082,847
274 4,082,849
278 4,082,850
300 4,082,851
317 4,082,852

CLASS 425

129 R 4,082,486
135 4,082,487
204 4,082,488
222 4,082,489
412 4,082,490
440 4,082,491
451 4,082,492

CLASS 426

36 4,082,853
106 4,082,854
250 4,082,855
299 4,082,856
573 4,082,857
597 4,082,858
636 4,082,859

CLASS 427

27 4,082,860
56 4,082,861
133 4,082,862
181 4,082,863
248 B 4,082,864
253 4,082,865
294 4,082,866
327 4,082,867
329 4,082,868
357 4,082,869
425 4,082,870

CLASS 428

15 4,082,871
24 4,082,872
35 4,082,877
40 4,082,873
54 4,082,874
134 4,082,875
159 4,082,876
195 4,082,878
219 4,082,879
220 4,082,880
246 4,082,882
253 4,082,883
262 4,082,884
281 4,082,885
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289 4,082,887
327 4,082,888
328 4,082,889
4,082,890
332 4,082,892
335 4,082,894
376 4,082,893
412 4,082,891
4,082,895
413 4,082,896
426 4,082,897
427 4,082,898
457 4,082,899
4,082,902
469 4,082,900
480 4,082,901
514 4,082,903
528 4,082,904
538 4,082,905
539 4,082,906
640 4,082,907
672 4,082,908

CLASS 431

25 4,082,493
95 R 4,082,494
158 4,082,497
183 4,082,495
343 4,082,496

CLASS 432

14 4,082,498
19 4,082,499

CLASS 526

4 4,082,909

CLASS 528

481 4,082,910

CLASS 536

23 4,082,911
30 4,082,743

CLASS 544

26 4,082,912
98 4,082,748

CLASS 560

102 4,082,913
121 4,082,789
260 4,082,791

CLASSIFICATION OF DESIGNS

D1—	16	247,656		161	247,662		12	247,668			247,674
D2—	270	247,657	D8—	313	247,663			247,669			247,675
	320	247,658	D10—	101	247,664		53	247,670		41	247,676
D6—	28	247,659		121	247,665	D15—	52	247,671	D22—	18	247,677
D7—	71	247,660	D12—	146	247,666		126	247,672		27	247,678
	107	247,661	D14—	11	247,667	D16—	32	247,673	D23—	17	247,679

	35	247,680		5 MM	247,684			
D24—	61	247,681		5 QQ	247,685			
D27—	42	247,682		15 C	247,688			
D28—	13	247,683	D48—	20 K	247,689			
D34—	5 CB	247,686		24 R	247,690			
	5 HP	247,687						

CLASSIFICATION OF PLANTS

P.—	31	4,236		38	4,232		68	4,233			4,234

		4,235									

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

8—	25	T969,001		64 F	T969,003		100 R	T969,005	219–121 EM		T969,007	346—	74.1	T969,009							
71—	29	T969,002	96—	27 R	T969,004		126	T969,006	260—	78.41	T969,008	357—	46	T969,010	427—	207 B	T969,011				

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,082,064	4,082,240	4,082,991	4,081,923	4,082,401	4,083,013
4,082,161	4,082,242	4,082,999	4,081,957	4,082,409	4,083,047
2 : 4,081,916	4,082,266	4,083,002	4,081,965	4,082,412	19 : 4,082,192
4 : 4,081,885	4,082,267	4,083,003	4,082,117	4,082,531	4,082,227
4,082,075	4,082,269	4,083,005	4,082,126	4,082,612	4,082,238
4,082,080	4,082,274	4,083,007	4,082,244	4,082,622	4,082,371
4,082,225	4,082,281	4,083,010	4,082,249	4,082,638	4,082,592
4,082,304	4,082,286	4,083,016	4,082,306	4,082,643	20 : 4,081,954
4,082,483	4,082,287	4,083,033	4,082,391	4,082,644	4,082,007
4,082,604	4,082,311	4,083,035	4,082,567	4,082,647	4,082,524
4,082,908	4,082,322	4,083,043	4,082,918	4,082,649	4,082,586
4,082,961	4,082,330	4,083,044	4,082,944	4,082,651	4,082,765
4,083,045	4,082,334	4,083,046	4,083,042	4,082,653	4,082,957
5 : 4,082,212	4,082,339	4,083,050	13 : 4,081,945	4,082,654	4,082,992
6 : Re.29,604	4,082,353	7 : 4,081,941	4,081,987	4,082,668	21 : 4,081,910
4,081,868	4,082,379	8 : 4,081,904	4,082,044	4,082,694	4,081,997
4,081,878	4,082,392	4,082,145	4,082,136	4,082,696	4,082,256
4,081,906	4,082,415	4,082,241	4,082,202	4,082,716	4,083,061
4,081,907	4,082,428	4,082,449	4,082,305	4,082,795	22 : 4,081,990
4,081,925	4,082,436	4,082,462	4,082,573	4,082,798	4,082,500
4,081,958	4,082,448	4,082,474	4,082,589	4,082,869	4,082,833
4,081,962	4,082,471	4,082,645	4,082,655	4,082,885	23 : 4,082,414
4,081,980	4,082,475	4,082,738	4,082,904	4,082,886	24 : 4,081,886
4,081,995	4,082,482	4,082,983	16 : 4,081,864	4,082,925	4,082,143
4,082,000	4,082,493	4,082,998	4,082,608	4,082,977	4,082,169
4,082,005	4,082,509	4,083,040	17 : Re.29,603	4,082,986	4,082,271
4,082,025	4,082,516	4,083,057	4,081,880	4,083,025	4,082,301
4,082,028	4,082,525	9 : 4,081,882	4,081,897	4,083,037	4,082,568
4,082,041	4,082,607	4,081,902	4,081,918	4,083,052	4,082,583
4,082,049	4,082,614	4,081,953	4,081,938	18 : 4,081,929	4,082,585
4,082,055	4,082,633	4,082,006	4,081,942	4,082,009	4,082,709
4,082,063	4,082,667	4,082,016	4,081,996	4,082,011	4,082,830
4,082,081	4,082,671	4,082,085	4,082,029	4,082,012	4,083,004
4,082,083	4,082,677	4,082,200	4,082,030	4,082,013	4,083,015
4,082,093	4,082,697	4,082,245	4,082,045	4,082,139	4,083,049
4,082,094	4,082,735	4,082,375	4,082,072	4,082,166	25 : 4,081,903
4,082,097	4,082,736	4,082,396	4,082,086	4,082,180	4,081,917
4,082,102	4,082,799	4,082,413	4,082,153	4,082,216	4,082,059
4,082,109	4,082,800	4,082,574	4,082,154	4,082,257	4,082,060
4,082,121	4,082,812	4,082,603	4,082,156	4,082,309	4,082,115
4,082,133	4,082,814	4,082,652	4,082,170	4,082,329	4,082,118
4,082,140	4,082,834	4,082,717	4,082,197	4,082,388	4,082,182
4,082,146	4,082,836	4,082,777	4,082,206	4,082,534	4,082,360
4,082,162	4,082,837	4,082,897	4,082,224	4,082,627	4,082,385
4,082,189	4,082,838	4,082,935	4,082,268	4,082,753	4,082,422
4,082,208	4,082,864	4,083,041	4,082,278	4,082,754	4,082,442
4,082,214	4,082,874	06 : 4,082,356	4,082,292	4,082,762	4,082,446
4,082,218	4,082,906	10 : 4,082,730	4,082,299	4,082,766	4,082,473
4,082,229	4,082,922	4,082,787	4,082,310	4,082,774	4,082,484
4,082,230	4,082,927	4,082,848	4,082,331	4,082,810	4,082,570
4,082,231	4,082,940	11 : 4,082,884	4,082,343	4,082,870	4,082,674
4,082,235	4,082,978	12 : 4,081,893	4,082,345	4,082,892	4,082,699
4,082,237	4,082,988	4,081,894	4,082,349	4,082,926	4,082,821

4,082,840
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247,687

247,689
12 : 247,681
17 : 247,665
247,668

25 : 247,661
26 : 247,667
27 : 247,679
32 : 247,671

34 : 247,677
247,683
36 : 247,662
247,670

247,673
247,674
247,675
247,684

39 : 247,658
247,678
42 : 247,690
48 : 247,656

PLANT PATENTS

6 : 4,232
17 : 4,233
4,234
48 : 4,236

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

1 : T969,002
T969,003
6 : T969,007
17 : T969,010
36 : T969,009
45 : T969,001

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